

The *Hygrocybeae* (Fungi, Basidiomycota, Agaricales, Hygrophoraceae) of the Lane Cove Bushland Park, New South Wales

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Summary

Young, A.M. (1999). *Austrobaileya* 5(3): 535-564. The Australian species of tribe Hygrocybeae within the Lane Cove Bushland Park of Sydney, New South Wales are discussed and two genera are recorded: *Hygrocybe* (Fr.) Kummer; and *Camarophyllopsis* Herink. Eighteen taxa are included, with three new species and a new variety described: *Hygrocybe austropratensis*, *H. lanecovensisi*, *Camarophyllopsis kearneyi* and *Hygrocybe anomala* var. *ianthinomarginata*. The data for a fifth undescribed taxon is included to facilitate its identification and the collection of sufficient material for a holotype. Photographic material indicates that at least another three taxa may be present in the area. *Camarophyllus lilacinus* (Cleland & Cheel) is transferred to *Hygrocybe* (Fr.) Kummer under the new name *Hygrocybe cheelii* nom. nov. The relationship of *Hygrocybe graminicolor* (Horak) May & Wood with *Gliophorus pallidus* Horak and *Hygrocybe batesii* A. M. Young is discussed and both *Gliophorus pallidus* and *Hygrocybe batesii* are reduced to synonymy with *Hygrocybe graminicolor*. Keys, descriptions and line drawings are provided to facilitate identification.

Key words: Hygrophoraceae, Hygrocybeae, *Hygrocybe*, *Camarophyllopsis*, *Hygrocybe austropratensis*, *H. cheelii*, *H. lanecovensisi*, *H. anomala* var. *ianthinomarginata*, *Camarophyllopsis kearneyi*.

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The Lane Cove Bushland Park

The initial paper on the Australian Hygrophoraceae Lotsy (Young and Wood 1997) defined 57 taxa. Ongoing field work during the 1998 season has added considerable information about this agaric family for south eastern Australia. The Gore Creek gully of the Lane Cove Bushland Park – 5.7 km north west of the centre of Sydney, New South Wales – was found to have at least 18 taxa belonging to tribe Hygrocybeae Kühner within a very small and roughly rectangular area approximately 150 metres long and 50 metres wide. Photographic records indicate that there may be as many as 20 to 25 taxa belonging to family Hygrophoraceae at the location. The Gore Creek site is unusual for the Sydney region in that it remains one of the few places where both sides of a gully have been preserved from housing development with consequent retention of the closed canopy that appears to be essential for the preservation of the forest Hygrophoraceae. The presence of so many taxa in such a small

area suggests that although the locality is heavily impacted by human passage, the soils seem to have remained relatively pollutant free.

Gore Creek is a natural, permanent waterway which runs directly into Sydney Harbour. The aspect of the creek is mostly north-south so that the site is shielded from afternoon sun intensity and receives less sunlight than the surroundings during winter.

The collection site is within an often steep sided gully drained by Gore Creek but the gully bottom has flat areas built up of sandy soils classified as 'Hawkesbury landscape soils' after the sandstone substrates from which they are primarily derived, although the creek does receive some drainage from richer shale soils found in its upper reaches or sometimes on the gully sides. The gully soils are usually greater than 50 cm deep and are naturally low in fertility (Chapman and Murphy 1989). The 'softness' of these alluvial soils coupled with the often heavy rainfall of the area means that considerable erosion can take place if interference (whether natural or human

induced) with the vegetation of the creek banks takes place. Where the creek runs through these soft alluvial soils, steep banks (1–2 metres high) can occur naturally.

The vegetation structure of the Gore Creek gully site is that of a gallery warm-temperate rainforest (Williams, Harden and McDonald 1984) centred on the creek with enclosing and protective myrtaceous woodlands/forests situated on the gully walls. Gallery warm-temperate rainforests are extremely specialised: they form narrow bands of closed canopy forest with central creeks in a ‘tunnel-like core’ and are usually found on poor soils. They have a much reduced epiphyte content and generally, as here, contain only a small number of canopy tree species (3–15). They are not the equivalent of sub-tropical rainforests which contain many more canopy tree species (10–60), have extensive epiphytic floras, are found on rich soils and are not tied to creek margins. These gallery rainforests are also found in the plateau of the Hornsby–Hawkesbury area directly north of Sydney and they are often situated within the deep gullies that run down from that sandstone plateau. They exist first, because the sites are protected from the very dry conditions of the plateau summit and second, because the gully soils are nutrient enriched by water run-off. This second condition is of critical importance because the Hawkesbury sandstone, which forms much of the substrate for this region, is extremely lacking in nutrients.

The dominant vegetation in the Hygrocybe site is a closed forest of ‘lilly pilly’ *Acmena smithii* (Poir.) Merrill & Perry, ‘grey myrtle’ *Backhousia myrtifolia* Hook. f. & Harv., ‘cheese tree’ *Glochidion ferdinandi* (Müll. Arg.) F. M. Bailey and ‘sweet pittosporum’ *Pittosporum undulatum* Vent. Coachwood, *Ceratopetalum apetalum* D. Don is also present (Armitage and Klaphake 1996). Under the closed canopy, a lower layer of ferns is distributed randomly beside the creek and on its steep banks. The tree species listed above form the core of the gully vegetation and are primarily responsible for inducing the extremely favourable humid microclimate upon which the fungi depend, however these trees in turn are dependent, at least partially, upon the presence

of the open sclerophyll forest which lines the gully sides and which acts as a ‘buffer zone’. Both sides of the gully are covered in eucalypt open woodland and forest growing on the sandstone or shale soils and producing a dense layer of litter. The dominant species on these slopes belong to the Myrtaceae and include ‘blackbutt’ *Eucalyptus pilularis* Sm., ‘Sydney red gum’ *Angophora costata* (Gaertn.) Britten and ‘turpentine’ *Syncarpia glomulifera* (Sm.) Niedenzu (Armitage and Klaphake 1996). Considerable light reaches the woodland or forest floor on the gully sides.

The more or less coastal climate of the region is humid and temperate. No records are kept specifically for the park area, however full weather details are maintained for the Riverview Observatory 2 kilometres west of the park site. These records are considered to be directly applicable to the park and they show an average annual rainfall of 1137 mm. The rainfall for the months of May, June and July average 106, 118 and 87 mm respectively while no month of the year has an average rainfall of less than 63 mm. Minimum and maximum temperatures for these months are: May 9.7, 19.5; June 7.5, 17.0; July 6.1, 16.6 degrees Celsius. From observations concerning the climatic requirements of the Hygrophyceae within Australia, the weather conditions and the associated microclimate of the gully are most favourable for these fungi and at least partially account for the species diversity of the Hygrophyceae at this site.

Materials and Methods

For most taxa, a number of collections from the Lane Cove Bushland Park are held, however since these mostly duplicate previously known information, only a representative sample of two or three exemplar collections is listed here. On occasion, material from outside the Lane Cove Bushland Park is cited where this addition provides an important extension of a taxon’s geographical range, where no material is held for taxa that are definitely known to occur on the Gore Creek site, or where the listing was considered essential for purposes of taxonomic revision.

For all material collected by the author, colours of the fresh basidiomes were referenced

to Kornerup and Wanscher (1981). Colour references are missing for other collections. Material was preserved by air drying. Habitat details are supplied for the taxon as generally known (Young and Wood 1997) with specific reference to the Lane Cove Bushland Park occurrence where necessary. Holotype material for the newly described taxa is deposited at the Orange Agricultural Institute Herbarium (DAR), Orange, New South Wales.

All light microscopy was completed on an Olympus CX40 microscope with drawing tube attachment and calibrated with an Olympus 1 mm slide. Hand sections of dried material gave best results and these were re-constituted in ammoniated congo red. Pileipellis transverse sections were always taken radially in order to examine both the centre and marginal surfaces.

Illustrations are provided for the new taxa and for those species which are either not covered by relevant illustrations in Young and Wood (1997) or which require additional diagrams as a result of new information. Where present, the habit sketch and transverse section show basidiome dimensions and lamellae attachment; both are referenced to a 1 cm scale bar. For the microscopic drawings, the pileal, hymenophoral tramal or stipital structures are not shown here unless they are exceptionally unusual because they usually conform to standard forms (see Young and Wood 1997). For each illustrated specimen, 20 spores and 10 basidia were selected at random, drawn and measured. Cystidia were drawn if present. A 10 μm scale bar is placed beside each drawing of a microcharacter.

The derived measurement 'Q' is defined as the quotient of the mean length divided by the mean width for the relevant spore or basidial measurements. The range of Q for each taxon is derived from the combined results of all collections. In practice it has been found that the values of the spore mean for most collections will not vary more than $\pm 0.5 \mu\text{m}$ from the values given here; the mean Q for the spores seems to vary by a lesser amount and most collections seem to be within a value ± 0.3 from that given here. The values for the basidial length and width means and mean Q's should be applied similarly.

The previous paper by Young and Wood (1997) used a derived parameter 'R' which was defined as the quotient of the mean basidial length and the mean spore length of the taxon. This parameter has been discarded. Further studies have shown that the results for R vary so much between collections that a reasonably stable reference value cannot be established for any one taxon. The large variations are due to the fact that relatively minor alterations in mean spore length produce quite large changes in the derived quotient.

Herbaria

Herbaria which made material available for this study (or at which material is deposited) are:

UNSW: School of Biological Sciences, University of New South Wales, Kensington, NSW, Australia.

DAR: Orange Agricultural Institute Herbarium, Orange, NSW, Australia.

PDD: Herbarium PDD, Manaaki Whenua Landcare Research, Auckland, New Zealand.

AD: State Herbarium, SA, Australia.

Comments

The taxa listed or newly described in this paper represent a large percentage of the species present, however it is known that more than the eighteen taxa presented here, do occur at the site. Photographic records exist of a grey taxon with a 'tricholomatoid' appearance but with very thick and distant lamellae; supporting information suggests that this taxon will be allocated to genus *Hygrocybe*. There is also a bright yellow, dry taxon with deeply decurrent lamellae which may belong to the *Hygrophoraceae*. The 'coachwood collections' belonging to genus *Camarophyllopsis* were considered sufficiently close at this stage to warrant their placement with the new taxon described from fern banks beside the central creek, however further work may show the coachwood material does represent a separate species. Other taxa are likely to appear given sufficient time for further collections at the site: for example, a photographic slide exists of a fungus found at Gore Creek which is likely to

be *Hygrocybe miniata* (Fr.: Fr.) Kummer, a species that is reasonably common in the Sydney region.

One of the most spectacular species in the Gore Creek area is *Hygrocybe graminicolor*. This forms troops in the litter of the eucalypt woodland or forest and is quite common. An interesting aspect of its occurrence is that it often appears in the deep litter just below a sandstone 'overhang'. These overhangs are sandstone outcrops on the gully walls where water drips or spills over (sometimes in miniature waterfalls) during heavy rain. The overhang concentrates rain runoff so that the litter below is kept very moist during the mycelial growth season. These 'drip areas' also occur in the Blue Mountains National Park and they were deliberately sought when collecting Hygrophoraceae as experience showed that the associated litter zone usually provided much richer fruitings of any fungal species present in the area.

The poor sandy soils of the park seem to be ideal for the growth of the Hygrophoraceae. Troops of the various red taxa are frequently found on the sheltered sites near the creek and also in moss crevices along the walls of the creek banks. The species *Camarophyllopsis kearneyi* Young grows along the creek banks but so far has only been collected from the bare soil between clumps of fern and under a dense layer of their fronds.

Fruiting appears to begin about mid May and then continues until mid July with a few basidiomes appearing in August if conditions remain perfect. This fruiting of the Hygrophoraceae is now thought to be more or less consistent throughout the south eastern coastal area of Australia from the Sydney region to Tasmania: the collection data for 1998 suggests that when the Hygrophoraceae are fruiting in Tasmania, the same taxa will also be fruiting in Victoria and New South Wales. Generally, basidiomes of the Hygrophoraceae appear later in the season than do many other agarics and then continue to be produced until either heavy frost or lack of rain bring the season to an end. Exactly what triggers the start of fruiting is still not certain.

It is also interesting to compare the occurrence of the Hygrophoraceae of the Gore Creek site with the occurrence of similar or the same taxa in Tasmania and elsewhere in eastern Australia. Collecting during 1998 in various forest areas of Tasmania demonstrated that the Hygrophoraceae in that state occur almost exclusively in the beech forests (*Nothofagus cunninghamii* (Hook. f.) Oerst.) and particularly in the deep moss beds that are found on those forest floors. Open forest was ignored as previous experience had shown that few Hygrophoraceae, if any, occurred in those areas. In Victoria and New South Wales, basidiomes were found abundantly in soil and litter in moist eucalypt forests or subtropical or warm temperate rainforests. The type locality of the Queensland taxon, *Hygrocybe iropus* Young, is a dry sclerophyll woodland on a very exposed and open bluff in the Bunya Mountains. The microhabitats of the various Gore Creek taxa are comparable with elsewhere in southern Australia in that various species are found on bare soil or amongst short moss in the gallery rainforest, but other species (for example *Hygrocybe virginea* (Wulfen.: Fr.) Orton & Watling) will mostly or always be found in the eucalypt litter areas of the gully walls.

The Gore Creek site collections have assisted enormously in developing better species concepts for some of the taxa published in the first paper on the Australian Hygrophoraceae (Young and Wood 1997). This first paper was largely produced from herbarium material assisted by associated field notes and photographic material because the drought conditions largely dominating Australia during that paper's development were not conducive to field work on the Hygrophoraceae. Many species of the Hygrophoraceae have a wide range of colours and other macrocharacters and some are now known to have basidiomes that change colours as they mature. It is now recognised that one of the published taxa, *Hygrocybe batesii*, was described from good collections made of the species *Hygrocybe graminicolor* when it was exhibiting colour characters at one end of its range of variations and this paper corrects that error. Conversely, other taxa (eg. *Hygrocybe aurantipes* A. M.

Young) have been shown to be remarkably stable in colour and in both macro- and micro-characters so that the description has required little, if any, additional information.

Taxonomy

Family **Hygrophoraceae** Lotsy Votr. Bot. Stammesg. **1**: 706 (1907).

Basidiome small to medium sized, stipitate. Pileus conical, convex, umbilicate or infundibuliform; sometimes perforate; surface dry, moist, viscid or glutinous and may be smooth to squamulose or fibrillose. Lamellae generally thick, waxy, and distant; free or adnexed to decurrent. Stipe central, often brittle, with similar surface moisture or structures to

pileus. Universal veil generally absent. Context soft, frequently thin, waxy and translucent. Spore print white, cream, pale violaceous or magenta. Spores small to large, smooth rarely nodulose or echinulate, subglobose to ovoid, ellipsoid or cylindrical, sometimes constricted, hyaline or rarely with dark contents, inamyloid rarely amyloid. Basidia often long and narrow. Cheilocystidia sometimes present, pleurocystidia rare. Hymenophoral trama regular, irregular or bilateral. Pileipellis a cutis or trichoderm (sometimes gelatinised or glutinous) or rarely a hymeniderm. Development gymnocarpic, occasionally hemiangiocarpic. Terrestrial rarely lignicolous, mycorrhizal or saprophytic. **Type:** *Hygrophorus* Fr.

Key to the Tribes of *Hygrophoraceae*

- 1. Lamellae with regular to irregular trama, never divergent. **Hygrocybeae** Kühner
- Lamellae with divergent trama **Hygrophoreae** P. Henn. (not considered further.)

Tribe **Hygrocybeae** Kühner, Bull. mens. Soc. linn. Lyon **48**: 621 (1979).

Hymenophoral trama regular to irregular; not forming ectomycorrhizae.

Type: *Hygrocybe* (Fr.) Kummer.

Key to the Genera of *Hygrocybeae*

- 1. Pileipellis composed of hyphae forming a cutis, ixocutis, trichoderm or ixotrichoderm of non-inflated, hyphal elements. **Hygrocybe**
- Pileipellis an hymeniderm but sometimes approaching an epithelium and then composed of inflated elements **Camarophyllopsis**

1. Hygrocybe (Schaeff.: Fr.) Kummer, Führ. Pilzk.: 26 (1871); *Hygrocybe* Fr., Syst. Myc. **1**: 101 (1821); *Camarophyllus* Fr., Syst. Myc. **1**: 98 (1821); *Camarophyllus* (Fr.) Kummer, Führ. Pilzk.: 2 (1871). **Type:** *Agaricus conicus* Schaeff., Fungi Bavariae **4**: 2 (1774).

Basidiome fleshy, often watery or waxy in texture, collybioid, mycenoid or omphaloid, generally small to medium sized but occasionally large; variously coloured, often bright red, orange, yellow, green and lilac or

combinations of these colours; pileus opaque or hygrophanous, striate or not, dry to glutinous, smooth to squamulose or fibrillose; lamellae usually sub-distant to distant, free to adnate or decurrent, thick to very thick and with waxy appearance when fresh; velar structures absent; stipe dry to glutinous, smooth to squamulose or fibrillose; spore print white, cream coloured, pale magenta or pale lilac. Spores hyaline, smooth or rarely spinose, non-amyloid (for known Australian taxa); basidia sometimes long (25–70µm), Q: 2.5–10.0,

2- and 4-spored forms frequent; cheilocystidia present in some species either as true or pseudo-cystidia; pleurocystidia rare and then as pseudo-pleurocystidia; lamellae trama regular, subregular to irregular, tramal elements from very long (> 1000 µm) to very short (< 30 µm); clamp connections usually present; pileipellis a cutis, ixocutis, trichoderm or ixotrichoderm. Development gymnocarpic and

stipitocarpic.

Habitat and Distribution: Solitary to gregarious, terrestrial rarely on wood and then only if extremely rotten; substrates include soil, humus, moss; grasslands to forest and saprophytic. Cosmopolitan from subarctic or subantarctic to tropics and alpine regions.

Key to the Subgenera of *Hygrocybe*

1. Hymenophoral trama irregular, composed of short (20–150 µm) interwoven hyphal elements; basidiome often with subdued colours (white, brown, lilac-grey) but may be orange, apricot or bright lilac; lamellae arcuate to decurrent; clamps frequent throughout the basidiome, occasionally rare in the hymenophoral trama subgen. **Cuphophyllus** Key 1
- Hymenophoral trama regular to subregular (if subregular, then basidiome brightly coloured) and composed of parallel hyphal elements which are either 'long tubular' or chains of short elements; basidiome often very brightly coloured (red, orange, yellow, green, lilac); lamellae variously attached; clamps usually frequent throughout the basidiome or at least at the bases of the basidia 2
2. Hymenophoral trama very regular, composed of very long (1000–3000 µm), aseptate, tubular elements with tapered ends; lamellae free, ascending or narrowly adnate; tissues may blacken on bruising; basidia usually short (mean length 30–40 (–45) µm); except for the aseptate hymenophoral trama, clamps usually present throughout the basidiome, rarely absent in some taxa with 2-spored basidia subgen. **Hygrocybe** (Key 2)
- Hymenophoral trama regular to subregular, composed of parallel chains of short, sometimes inflated hyphal elements (usually 20–400 µm); lamellae adnate to decurrent; tissues never blackening on bruising; basidia sometimes long (40–60 µm); clamps either present throughout the basidiome present only at the bases of the basidia 3
3. Clamps present throughout the basidiome and of medallion form or not; pileus never splitting radially so that the split occurs along the medial section of a lamella subgen. **Pseudohygrocybe** (Key 3)
- Clamps absent throughout the basidiome except at the bases of the basidia and then frequently of medallion form; pilei tending to split radially along the medial line of at least some lamellae so that the half lamellae remain joined at the lamellae margins and also attached to the pileus at the edges of the radial split subgen. **Humidicutis** (Key 4)

Key 1: Species of Subgenus *Cuphophyllus*

1. Pileus white to slightly greyish, sometimes with brownish centre **5. H. virginea**
- Pileus mauve to lilac, pinkish lilac, lilac brown, orange, orange brown or apricot orange 2

- 2. Pileus mauve, pinkish mauve, lilac or lilac brown 3
 Pileus orange, orange brown, or apricot orange 4
- 3. Pileus bright pinkish mauve or lilac, never hygrophanous;
 stipe yellow at the base **3. H.cheelii**
 Pileus pale lilac to lilac grey, usually rather hygrophanous
 and drying pallid buff with lilac tints; stipe never yellow at
 the base **4. H. reesiaie**
- 4. Pileus apricot orange; basidiomes slender and thin fleshed;
 always smooth; lamellae interveined; spores 5–6 x 4–5 μm **1. H. aurantiopallens**
 Pileus yellow orange to light orange brown; basidiomes stout;
 at first with whitish furfuraceous coating over much of the surface
 and often with residues at the margins; lamellae without interveins;
 spores 6–8.5 x 5–7 μm **2. H. austropratensis**

Key 2: Species of *H.* subgen. *Hygrocybe*

- 1. One species known in the area: pileus conical, often red or
 yellow; all tissues rapidly blackening on bruising and exuding
 a pale, watery yellow fluid if cut; pileal and stipe surfaces
 covered in abundant, blackish fibrils. **6. H. astatogala**

Key 3: Species of *H.* subgen. *Pseudohygrocybe*

- 1. Pileipellis a dry cutis or trichoderm (rarely a very weak
 ixocutis demonstrated only by microscopic examination of
 gelatinisation of surface hyphae) 2
 Pileipellis a well developed ixocutis or ixotrichoderm (while
 in some mature basidiomes the viscosity may not be apparent,
 the nature of the ixocutis is always clearly apparent in juvenile
 basidiomes and can be restored in dry adult basidiomes by applying
 a small drop of distilled water). 6
- 2. Pileipellis a trichoderm at least at the centre and appearing
 finely velvety or tomentose as the pileus matures and dries;
 pileus and stipe deep red to orange, lamellae cream coloured
 to pale yellow. **9. H. cantharellus**
 Pileus a cutis (rarely a very weak ixocutis demonstrated
 microscopically), pileus, stipe and lamellae variously coloured 3
- 3. Lamellae pale to very pale lilac; pileus light orange brown and
 often with pallid lilac margins; spinose spores found occasionally
 at random amongst the normal spores **7. H. anomala**
 Lamellae white or a shade of yellow; pileus olive brown or red,
 stipe red or yellow; spinose spores never present 4
- 4. Pileus olive brown; stipe bright yellow or yellow orange **8. H. aurantipes**
 Pileus and stipe bright red 5
- 5. Pileus brilliant red with yellow, striate margins; lamellae deeply
 decurrent and bright yellow; most spores strongly constricted. **17. H. sp. LC1**
 Pileus red but without the yellow, striate margins; lamellae adnate,
 adnate with a decurrent tooth or arcuate and white to pallid yellow

- or cream coloured with faint brownish tints; constrictions present in only a few spores **13. H. kula**
6. Basidiomes completely bright chrome yellow **10. H. chromolimonea**
Basidiomes not completely bright chrome yellow 7
7. Pileus red 8
Pileus green, yellow green or a shade of brown 9
8. Lamellae deeply decurrent and pure white becoming pale yellow with age; stipe red **14. H. lanecovensisi**
Lamellae broadly adnate with at most a decurrent tooth, creamy yellow to pinkish yellow; stipe clear yellow to yellow orange **11. H. erythrocala**
9. Cheilocystidia absent and lamellae margins without a gluten thread; lamellae usually adnate or with a decurrent tooth; spore mean length 7.5–8.5 μm **15. H. stevensoniae**
Cheilocystidia present and embedded in a gluten thread; lamellae always arcuate to deeply decurrent; spore mean length 6.0–7.0 μm **12. H. graminicolor**

Key 4: Species of *H. subgen. Humidicutis*

1. One species known in the area; basidiomes wholly lilac; pileus conical to umbonate, usually splitting radially with the splits severing the lamellae along the medial trama; clamps absent throughout the basidiome except at the bases of the basidia **16. H. lewellinae**

Camarophylloopsis Herink, Acta Mus. Horti Bot. Boh. Bor. **1**: 61 (1958). **Type:** *Camarophylloopsis schulzeri* (Bres.) Herink.

Basidiome thin to fleshy, small, dull coloured in grey to ochre or brown; pileus convex to umbilicate, dry and often hygrophanous; lamellae distant, broadly adnate to arcuate or decurrent; universal veil absent; stipe dry, often with small dots, pruinose punctate or fibrillose; spore print white. Spores hyaline, smooth, non-amyloid, subglobose to broadly ellipsoid, small (up to 7 μm long); basidia narrowly

clavate, 20–70 x 4.5–8.5 μm , Q: 4.5–10.0, mostly 4-spored; cystidia absent or inconspicuous; hymenophoral trama regular to subregular and composed of short elements up to 170 μm long; pileipellis an hymeniderm; clamp connections present or absent; development monovelangiocarpic and stipiticarpic.

Habitat and distribution: Solitary to subgregarious, terrestrial in forests or open sites, apparently saprophytic. Mostly in temperate North America, Asia and Europe, but also known from subtropical South America and Asia.

1. One species known in the area; basidiomes inconspicuous, brownish grey, with fibrils on the stipe; pileipellis composed of globose elements and giving the pileal surface a micaceous effect under a hand lens; lamellae whitish or greyish white and adnate to arcuate; in troops on soil under low ferns **18. C. kearneyi**

Field Key to the Hygrocybeae of Lane Cove Park

These 'artificial' keys use macro-characters which are either easily seen with the naked eye

or can be readily determined with a x10 hand lens. They have been constructed so that those

taxa which tend to lose their viscidosity as a group of distinctly glutinous taxa and the group maturation proceeds are included in both the of completely dry taxa.

Key to the Groups

1. Pileus viscid or glutinous Key 1
Pileus dry 2
2. Basidiomes (at least in part) brightly coloured: red, orange, yellow, lilac Key 2
Basidiomes dull coloured (brown, grey, black) or white Key 3

Key 1 - Pileus Viscid or Glutinous

1. Basidiome wholly bright chrome yellow **10. H. chromolimonea**
Basidiome green, brown or red 2
2. Pileus brilliant red/crimson 3
Pileus green or greenish brown, yellow brown or brown 4
3. Lamellae white becoming yellowish with age, deeply decurrent;
stipe red **14. H. lanecovensis**
Lamellae cream yellow, usually with pink tints, adnate with at most
a decurrent tooth; stipe yellow or yellow-orange **11. H. erythrocala**
4. Lamellae margins never with sticky, glutinous thread (use a x10
hand lens) **15. H. stvensoniae**
Lamellae margins always with a sticky, glutinous, often greyish
thread (use a x10 hand lens) **12. H. graminicolor**

Key 2 - Pileus Dry, Basidiomes Brightly Coloured (at least in part)

1. Basidiomes either with more or less strong lilac or mauve
colouration generally over the whole fruiting body or with
the lamellae only delicately but distinctly lilac tinted or with
both lamellae and the pileus margins lilac tinted 2
Basidiomes completely lacking in lilac or mauve colours or tints 5
2. Delicate lilac tints present either only on the lamellae or on both
the lamellae and the pileus margins, pileus orange brown **7. H. anomala**
Lilac or mauve colouration found generally over the entire
fruiting body, the basidiome is often very intensely coloured 3
3. Pileus conical to umbonate and frequently splitting radially
along the medial section of the lamellae; lamellae free, adnexed
or narrowly adnate **16. H. lewellinae**
Pileus convex and may become umbilicate, not splitting radially;
lamellae decurrent 4
4. Basidiomes an intense pinkish mauve or lilac; stem base
distinctly yellow; pileus finely velvety under a x10 hand lens **3. H. cheelii**
Basidiomes pale to intense lilac but without the pink tints; stem
base never yellow; pileus smooth under a x10 lens **4. H. reesiaae**
5. Pileus dark olive brown becoming paler with age and often

- showing yellow, greenish or orange tints; stipe bright yellow
to yellow orange **8. H. aurantipes**
Basidiomes not with the above pileus and stipe colour combination 6
6. Pileus bright orange to orange brown 7
Pileus red, or red bruising black 10
7. Basidiomes wholly apricot orange, the lamellae may be a slightly
paler shade **1. H. aurantiopallens**
Basidiomes not wholly apricot orange; lamellae cream coloured
or yellowish; if pale orange brown then fruiting bodies stout
and with deeply decurrent lamellae 8
8. Stipe thick (4–5 mm); pileus orange brown; both pileus and
stipe with a white, furfuraceous layer when immature and which
is lost as the fruiting body expands **2. H. austropratensis**
Stipe slender (1–3 mm), pileus orange; basidiomes without the white
furfuraceous layer on both pileus and stipe when immature 9
9. Pileus finely velvety tomentose at least at the centre (use a x10 hand
lens); lamellae deeply decurrent, at first white then becoming a shade
of yellow; stipe red with yellow base **9. H. cantharellus**
Pileus smooth; lamellae arcuate decurrent and yellowish brown or buff;
delicate lilac tints are usually present on the lamellae; stipe orange **7. H. anomala**
10. Lamellae ascending to broadly adnate with at most a decurrent tooth 11
Lamellae strongly decurrent 13
11. Pileus conical with abundant black fibrils; all tissues bruising black **6. H. astatogala**
Pileus convex without black fibrils; no tissues bruising black 12
12. Lamellae at first white, then becoming pallid yellow with age;
stipe red **13. H. kula**
Lamellae cream coloured from the start and then with pinkish tints;
stipe yellow or yellow orange **11. H. erythrocala**
13. Pileus finely velvety tomentose, at least at the centre (use x10
hand lens); lamellae at first pale cream coloured then more or less
yellow; basidiomes always with a slender stipe that is much longer
(at least 2–3 times) than the pileus diameter **9. H. cantharellus**
Pileus smooth; lamellae white or bright yellow; stipe not as above 14
14. Pileus with yellow, striate margins; lamellae always deeply
decurrent and bright yellow **17. H. sp. LC1**
Pileus without yellow, striate margins; lamellae pure white to
cream coloured **14. H. lanecovensis**

Key 3 - Pileus Dry, Basidiomes Dull Coloured (Brown, Grey, Black) or White

1. Pileus conical, black or deep grey with adpressed, black fibrils;
a pale yellow or clear fluid often weeps from the cut tissues **6. H. astatogala**
Pileus convex or convex and umbilicate, not black or deep grey
with adpressed black fibrils; never with pale yellow or clear fluid
weeping from cut tissues 2

2. Pileus white, usually hygrophanous and striate; stipe white **5. *H. virginea***
Pileus distinctly brown to orange brown; stipe brown 3
3. Stipe 4–5 mm thick, basidiomes robust; pileus dull orange brown
and usually covered with a white furfuraceous layer when immature
but which is lost as the fungus matures **2. *H. austropratensis***
Stipe 1–3 mm thick, basidiomes delicate; pileus orange brown or
grey brown but never covered with a white furfuraceous layer
when juvenile 4
4. Stipe with small, adpressed brown fibrils; pileus hemispherical,
pallid brown and appearing finely micaceous under a x10 hand
lens; lamellae white to greyish white **18. *Camarophyllopsis kearneyi***
Stipe without small, adpressed brown fibrils; pileus convex, orange
to orange brown, with fine lilac margins at least in juvenile stages
and not appearing finely micaceous under a x10 hand lens; lamellae
lilac tinted **7. *H. anomala***

Subgen. **Cuphophyllus** Donk, Beih. Nova.
Hedwigia **5**: 45 (1962). **Type:** *Agaricus*
pratensis Pers.: Fr. [= *Camarophyllus*
pratensis (Pers.: Fr.) Kummer.]

Hymenophoral trama irregular; basidiome dull
coloured or rarely with bright colours in
apricots, pinks or lilac to mauve; lamellae mostly
decurrent; cystidia mostly absent; clamps
frequent throughout the basidiome.

1. *Hygrocybe aurantiopallens* (Horak) A. M.
Young, Aust. Syst. Bot. **10**: 921 (1997);
Camarophyllus aurantiopallens Horak,
Beih. Nova Hedwigia **43**: 122 (1973). **Type:**
New Zealand. Lake Rotoiti, 29 April 1968,
E. Horak [PDD 27088] (holo: PDD).

Misappl.: *Hygrophorus aurantius* Murrill
sensu G. Stevenson, Kew Bull. **16(3)**: 382 (1963).

Illustration: Fuhrer & Robinson (1992), p 38;
Young & Wood (1997), p922.

Pileus (6–)10–20 mm, convex (occasionally
slightly umbonate), expanding to plano-
convex; smooth, dry, apricot yellow to light
orange (near 4A5), usually darker at the centre,
all parts fading with age; red tints completely
absent; a little pellucid striate if moist,
especially towards the margins; margins usually
slightly crenulate, especially when young.
Lamellae adnate arcuate to usually
subdecurrent; occasionally anastomosing; not
especially thick, widely spaced to distant, very

frequently connected by veins on the
undersurface of the pileus; pallid apricot or
pileus tinted, margins concolorous. Stipe 17–
44 x 1.5–3.5 mm, cylindrical but often tapers
towards the base, smooth, dry, hollow, pale
apricot yellow to similar to pileus but paler at
the base to near white.

Spores (3.5–)4.0–6.5 x 3.5–4.5(–5.0) μm ,
mean 5.2 x 4.2 μm , Q: 1.0–1.6, mean Q: 1.2–1.3,
mostly subglobose but occasionally
sublacrymoid, smooth, hyaline, non-amyloid.
Basidia 30–41 (–42.5) x 4.5–7(–8) μm , mean 34 x
6 μm , Q: 4.4–7.5, mean Q: 5.7, 4-spored
(occasional 2-spored forms exist), clamped,
sometimes with medallion clamps. Cystidia
absent. Hymenophoral trama subregular to
irregular, composed of hyaline, thin-walled,
septate, semi-inflated, at least partially
interwoven hyphae 20–90 (–120) x 3–12 (–15)
 μm , frequently constricted at the septa and
often with medallion clamps. Pileipellis a cutis,
(often some hyphae partially gelatinise to give
the appearance of an ixocutis, but fresh material
is not viscid), cuticular hyphae 1–3 μm diameter,
clamped, forming a repent layer 20–40 μm deep
overlying a subpellicular layer of hyaline,
clamped, inflated cells 40–80 x 6–12 μm ,
cuticular pigment plasmatic and also as
granules on the hyphal walls. Stipitipellis a
cutis of hyaline, thin-walled, inflated, clamped
hyphae 2–4 μm , sometimes overlain with a loose
layer of extensively branched, thin-walled,
clamped hyphae 3–8 μm ; subpellis an array of

inflated, thin-walled, hyaline, clamped, parallel elements 6–11 μm .

Habitat: Gregarious on soil in rainforest.

Specimens examined: New South Wales. Lane Cove Bushland Park, 13 June 1998, Young 2107 (BRI); 20 June 1998, R. & E. Kearney in Young 2171 (DAR).

Remarks: The characteristics of the Lane Cove collections are all extremely similar to those of previously published descriptions of this species and records show that it appears in both June and July. Fuhrer and Robinson (1992) stated that the New Zealand species *Hygrocybe apricosa* Horak (= *Camarophyllus apricosa sensu* Fuhrer & Robinson) occurred in Tasmania and provided a photograph (p38) considered to be this taxon. So far, no Tasmanian or Australian mainland collections of similar material have proven to be this New Zealand taxon which is readily distinguished from *Hygrocybe aurantiopallens* as *Hygrocybe apricosa* has small, ellipsoid spores (3–5 x 2.5–4 μm).

2. *Hygrocybe austropratensis* A. M. Young, **sp. nov.** Pileus 14–30 mm, convexus denique plano-convexus vel irregularis, aurantiaco-brunneus, pilei juniores cum stratum album furfuraceum. Lamellae decurrentes, aurantiaco-bubalinus pallens. Stipes 20–45 x 47 mm, cremeo-bubalinus pallens, cylindricus, siccus, laevis, stipes juniores cum stratum album furfuraceum. Sporae 6.0–8.3(–9.0) x 5.0–7.3 μm , Q: 1.1–1.4, lato-ellipsoideae usque subgloboseae, hyalinae, inamyloideae. Basidia 53–69 x 6–8 μm , (2-)4-spora, fibulata. Cystidia nulla. Trama hymenophoralis irregularis, fibulata. Epicutis pilei cutem formans. Gregaria vel caespitosa in humo sylvestris. **Typus:** New South Wales. Lane Cove Bushland Park. 33°49'S 151°10'E, 7 June 1998, R. & E. Kearney. [DAR 73916] (holo: DAR; iso: BRI).

Pileus 14–30 mm, orange to light orange brown (near 4A8), convex or a little irregularly convex expanding to plano-convex and then somewhat irregular to repand, dry; at first coated with a white, furfuraceous layer which is progressively lost as the pileus matures;

margins at first involute and may be slightly striate and often with whitish fragments on them similar to the pileal surface. Lamellae decurrent and sometimes apparently forking at the extreme margins on old pilei, no veins noted

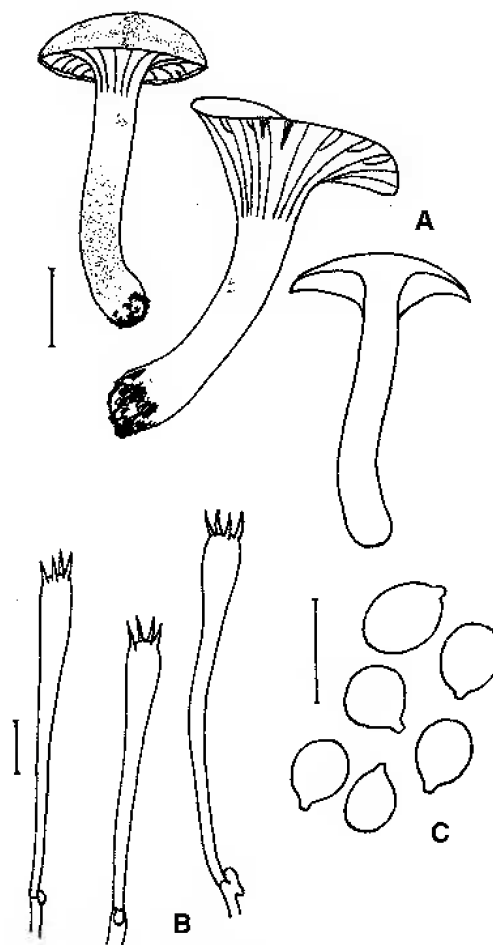


Fig. 1. *Hygrocybe austropratensis*. A. Habit (bar = 10 mm); B. basidia; C. spores (bar = 10 μm). Holotype DAR 73916.

between lamellae on the pileus undersurface, pale orange buff (4A4) and margins concolorous and even. Stipe 20–45 x 4–7 mm, very pale creamy brown (near 4A3), solid, dry, cylindrical but often bulbous at the base, smooth or usually coated with the white furfuraceous layer which slowly disappears on aging.

Spores 6–8.3(–9) x 5–7.3 μm , mean 7.5 x 6.3 μm , Q: 1.1–1.4, mean Q: 1.2, subglobose to very

broadly ellipsoid, smooth, hyaline. Basidia 53–69 x 6–8 µm, mean 62 x 6.8 µm, Q: 6.6–10.2(–12.6), mean Q: 9.2, 2- or 4-spored, clamped. Cystidia none. Hymenophoral trama irregular composed of hyaline, strongly interwoven, branched, clamped, cylindrical hyphae 2.5–7 µm diameter. Pileipellis a cutis of repent but extensively interwoven hyphae 3–6 µm diameter - in juvenile pilei the whitish layer is represented by an evanescent coating of delicate hyphae similar to the mature pileus' hyphae which disintegrate and disappear. Stipe a cutis of hyaline, thin walled, cylindrical, clamped hyphae 1.5–5 µm diameter. Fig. 1.

Habitat: Gregarious or caespitose on soil amongst eucalypt litter in woodland.

Remarks: This species seems quite close to *Hygrocybe pratensis* (Pers.: Fr.) Murrill. The spores and basidia of *H. austropratensis* are larger than the usual range of European material (5.5–6.5 x 4–5 µm for spores and 40–55 x 5–6 µm for basidia). Other variations include the often bulbous base which is lacking in European material, the much paler stipe and the brown colourations rather than the orange hues of *H. pratensis*. The white furfuraceous coating present abundantly in juvenile Australian material is absent from the European species.

Etymology: a southern hemisphere fungus (Latin, *australis*, south or southern) resembling the European *Hygrocybe pratensis* (Pers.: Fr.) Murrill

3. *Hygrocybe cheelii* A. M. Young, nom. nov.;
Cantharellus lilacinus Cleland & Cheel, Trans. & Proc. Roy. Soc. S. Australia **43**: 271 (1919); *Camarophyllus lilacinus* (Cleland & Cheel) Horak, New Zealand J. Bot. **28**: 203 (1990); non *Hygrocybe lilacina* (C. Laest. ex P. Karst.) M. Moser, Die Röhrlinge und Blätterpilze (Agaricales) 3 edit., 64 (1967). **Type:** New South Wales. Gladesville. 17 June 1916. (holo:AD, n.v.).

Illustration: Willis (1963), plate 9, 1 as *Cantharellus lilacinus*.

Pileus 15–25 mm, bright pinkish mauve or lilac

(15B5), convex, dry, smooth but finely velvety under a x10 lens, margins at first involute, sometimes a little crenulate or slightly plicate when immature, always with a fine white zone about 1 mm wide at the pileus margins. Flesh

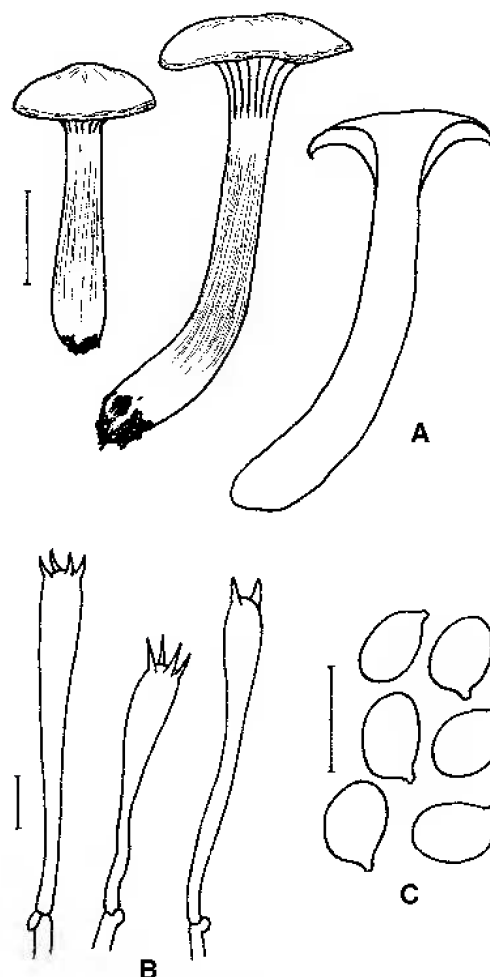


Fig. 2. *Hygrocybe cheelii*. A. Habit (bar = 10 mm); B. basidia; C. spores (bar = 10 µm). Y2118.

thick, white and with lilac tints in the pileus, may discolour slightly to yellowish brown in the tissues at the stipe base. Lamellae deeply decurrent sometimes arcuate, mauve lilac (15B3–15C3) and often with paler margins, distant, thick, sometimes forking especially towards the pileus margins. Stipe 30–50 x 7–9(–12) mm, pinkish mauve or lilac and concolorous with the pileus but yellow (3A3)

towards the stipe base, dry, fibrillose, solid, cylindrical superiorly but usually inflated towards the base.

Spores 6.7–8.7 x 4.7–6.3 μm , mean 7.8 x 5.5 μm , Q: 1.1–1.9, mean Q: 1.4, subglobose to ellipsoid, hyaline, smooth. Basidia 47–70 x (6–)7–9 μm , mean 59 x 7.7 μm , Q: 6.3–10.0, mean Q: 7.7, 4-spored but with some 2-spored basidia often scattered amongst the rest, clamped. Cystidia absent. Hymenophoral trama irregular and composed of interwoven, hyaline, cylindrical or sometimes a little inflated, branched hyphae 2–6 μm diameter, clamps abundant. Pileipellis a loose cutis (often approaching a trichoderm) of cylindrical, non-inflated, interwoven, branched hyphae 2.5–4.0 μm diameter often with short sections of hyphae projecting above the surface of the remainder and then with rounded, obtuse apices, pigment granules often present, clamps abundant. Stipitipellis a loose cutis of parallel and interwoven hyphae 1.5–5.0 μm diameter, clamps abundant, pigment granules usually visible on outermost hyphae. Fig. 2.

Habitat: Gregarious to caespitose on soil amongst leaf litter in wet or dry sclerophyll forest.

Specimen examined: New South Wales. Sheldon Forest Park. 34°44' 151°07'E., 14 June 1998, *F. Taeker* in *Young* 2118 (BRI).

Remarks: This taxon regularly appears in the Lane Cove Bushland Park and cannot be confused with any other species as no other Australian taxon has its intense and almost artificial colouration. Confirmatory photographic material is held for Lane Cove Park but no herbarium material. The description has been taken from typical material collected at a Sydney site approximately 10 kilometres distance. Originally placed in genus *Cantharellus* by Cleland and Cheel, there is no doubt that it is a valid member of the Hygrophoraceae as the lamellae are characteristic of the Agaricales not the pseudolamellae developed from hymenial folds that characterise the Cantharellaceae. The general morphology and the very irregular hymenophoral trama place this taxon in subgenus *Cuphophyllus*. This particular

collection is of interest as amongst the normal spores were a small number of larger, smooth, ellipsoid spores measuring about 11 x 8 μm . These larger spores do not appear to be contaminants and they may be derived from the occasional 2-spored basidia.

Etymology: after Edwin Cheel, botanical assistant at the Botanic Gardens, Sydney, New South Wales.

4. *Hygrocybe reesia* A. M. Young, *Aust. Syst. Bot.* **10**: 923 (1997). **Type:** New South Wales. Lane Cove Bushland Park, 17 June 1990, *R. Kearney* & *B. Rees* [UNSW 90/205](holo: UNSW).

Illustration: Young & Wood (1997), p924.

Pileus 10–20 mm, convex but depressed at the centre to almost umbilicate when mature, smooth, dry, margins even and not splitting, pale lilac to lilac grey (near 16B3) but fading to buff when old (4B4–4A3). Lamellae deeply decurrent, distant, thick, 1 or 2 sets lamellulae, deep lilac to near violet (16B6), margins concolorous. Stipe 16–30 x 3–4 mm, dry, smooth, cylindrical, pallid lilac (16A3) but darker superiorly becoming buff (4B4 4A3), hollow.

Spores (6–)6.5–9.0(–9.7) x 4.5–6.8 μm , mean 7.7 x 5.8 μm , Q: 1.1–1.5, mean Q: 1.3–1.4, very broadly elliptical to almost subglobose, apiculus prominent, smooth, hyaline, non-amyloid, thin-walled. Basidia 50–60 x (5.5–) 6.5–9.5 μm , mean 56 x 7.7 μm , Q: 5.9–9.2, mean Q: 7.4, 4-spored, clamped and often approaching medallion clamps or medallion clamps present. Cystidia absent. Hymenophoral trama subregular to interwoven, composed of hyaline, thin-walled, occasionally branching elements, 20–60 x 3–7 (–10) μm , only slightly constricted at the septa, but with abundant clamps some with medallion form, usually more irregular towards the margins. Pileipellis a cutis composed of an up to 10 μm thick layer of very narrow, hyaline, clamped hyphae (some medallion clamps), 2–3 μm diameter with the hyphal ends rounded, overlying a subparallel to interwoven subpellis of more inflated hyphae 2–9 μm diameter, frequently septate and clamped at all septa, frequently branching. Stipitipellis a cutis of hyaline, thin-walled,

clamped hyphae, 2–4 µm diameter, medallion clamps present.

Habitat: Gregarious on soil in woodland; often found in forests, frequently amongst moss.

Specimens examined: New South Wales. Lane Cove Bushland Park, 33°49'S 151°10'E. 7 June 1998, R. & E. Kearney in *Young* 2074 (BRI); in *Young* 2079 (DAR).

Remarks: *Hygrocybe reesia* is very widespread in the Sydney and Blue Mountains region of New South Wales and also occurs commonly in Tasmania. Its lilac colouration is generally quite distinct when the basidiomes contain their normal moisture, however the colours tend to pale to a lilac tinted buff when the basidiome surfaces dry out. The species often occurs in small troops.

5. *Hygrocybe virginea* (Wulfen: Fr.) Orton & Watling, Notes R. B. G. Edinb. **29:** 132 (1969); *Agaricus virgineus* Wulfen, in Jacq., Misc. austr. **2:** 104 (1781); *A. virgineus* Wulfen: Fr., Syst. mycol. **1:** 100 (1821); *Hygrophorus virgineus* (Wulfen: Fr.) Fr., Epicr.: 327 (1838); *Camarophyllus virgineus* (Wulfen: Fr.) Kummer, Führ. Pilzk.: 117 (1871); **Type:** none designated.

Agaricus niveus Scop., Fl. carn., Ed.2, **2:** 430 (1772); *A. virgineus*, var. *niveus* (Scop.) Fr., Syst. mycol. **1:** 100 (1821); *Hygrophorus niveus* (Scop.) Fr., Epicr.: 327 (1838); *Camarophyllus niveus* (Scop.) Wunsche, Pilze: 115 (1877). **Type:** none designated.

Illustrations: Cleland (1934) Plate III as *Hygrophorus niveus* (Scop.) Fr.; Boertmann (1995), 49; Young & Wood (1997), p929.

Pileus 19–35 mm, expanded convex becoming more or less plane and then usually umbilicate, smooth, dry, pure white becoming dull cream-coloured when old and often with cream-coloured tints at the very centre, when young appearing water soaked and pellucid striate for at least half the diameter of the pileus. Lamellae usually strongly decurrent, thick, distant, one set of lamellulae present, pure white or slightly tinted cream-colour with age, margins concolorous, some intervening is present

between the lamellae when old. Stipe 30–50 x 2–5 mm, pure white to slightly tinted cream-colour with age, more or less cylindrical near the lamellae but tapering towards the base, dry, smooth.

Spores (6.5–)7.0–11.0 x 4.0–6.6 µm, mean 7.5 x 5 µm, Q: 1.3–2.0, mean Q: 1.6, smooth, hyaline, non-amyloid, oblong to ellipsoid. Basidia 35–68(–80) x 5–7 (8.5) µm, mean 51 x 7, Q: 5.3–10, mean Q: 7.2, (2–)4-spored, clamped. Cystidia absent. Hymenophoral trama irregular, interwoven, composed of a mixture of hyaline, thin-walled, normal and inflated hyphae 36–110 x 3–20 µm, clamps present. Pileipellis a cutis of repent hyphae, 1–2 µm diameter, clamped, thin-walled, hyaline and slightly gelatinised. Stipitipellis a cutis of hyaline, thin-walled, clamped hyphae 2–4 µm.

Habitat: gregarious on soil amongst litter or moss in rainforest or open woodland.

Specimens examined: New South Wales. Lane Cove Bushland Park, 33°49'S 151°10'E. 13 June 1998, A. M. Young, (*Young* 2104 in BRI); 20 June 1998, R. & E. Kearney, (*Young* 2174 in DAR).

Remarks: This species occurs in troops in the moister eucalypt litter areas close to the central core of the rainforest. The pure white, more or less dry basidiomes with their deeply decurrent lamellae make them very easy to distinguish. The only Australian taxon with which *H. virginea* may be confused is *H. rodwayi* (Masse) A. M. Young which is readily separated by its marked cream colouration and small, subglobose spores (5.0–7.0 x 4.5–5.5 µm). Cleland (1934) recorded *Hygrophorus niveus* (Scop.) Fr. from the Blue Mountains (NSW), however material of his collection has not been located. Other Cleland collections of *H. niveus* have proven to be *H. rodwayi* which seems to be the most common of the two white taxa. The photograph supposedly of *Camarophyllus niveus* by Fuhrer and Robinson (1992) p39 is incorrect and appears to be an excellent photograph of the white form of *Hygrophorus involutus* G. Stevenson. (The nomenclatural priority of *Hygrocybe virginea* over *Hygrocybe nivea* is covered by Arnolds 1986, page 157.)

Subgen. **Hygrocybe.** **Type:** *Hygrocybe conica* (Schaeff.: Fr.) Kummer.

Hymenophoral trama strictly regular, composed of very long (500–3000 µm), tubular, aseptate elements with tapered ends; basidiome frequently vividly coloured (red, orange, yellow); pileus often conical; lamellae free, adnexed or narrowly adnate; cystidia sometimes present; clamps generally present throughout the basidiome.

6. *Hygrocybe astatogala* (Heim) Heinemann; *Bertrandia astatogala* (Heim) Heim, Rev. Mycol. **31**: 155 (1966); *Hygrocybe astatogala* (Heim) Heinemann, Bull. Jard. Bot. État **33**: 436 (1963). **Type:** Madagascar. (holo: P. n.v.)

Illustrations: Fuhrer & Robinson (1992), p38; Young & Wood (1997), p 933.

Pileus 13–30(–60) mm, at first elongated ellipsoid with margins adpressed to the stem, then rapidly expanding to conical but with the margins remaining more or less incurved, finally broadly conical with obtuse apex; immature colour very variable: red (10B8), orange (5A8) or yellow (3A7) (or mixtures of these colours and sometimes with greenish tints), often overlain with sooty black, eventually more or less black with only a few tints remaining of the previous colours; surface dry, smooth, and covered with radially adpressed, black fibrils; margins even to ragged and often paler than the pileal surface; frequently splitting radially. Pileal flesh very thin, similar to or slightly darker than the pileal cuticle colour directly above; stem flesh usually yellow (2A6). Lamellae adnate-ascending to more or less free, yellow (3A6) to orange (5A8) especially near the margins but darker near the pileus tissues, thick, usually well-spaced, waxy in appearance; margins entire, concolorous. Stipe (40–)60–85 x 3–4 mm, dry, cylindrical but often tapering apically, may be slightly fissured longitudinally and a little twisted, hollow, very pale yellow (3A3) to orange (4A5), may have red tints, white at the base; more or less covered with black fibrils. Odour none, taste mild. All tissues exude a clear to yellow tinted aqueous fluid when cut and rapidly turn black on exposure to air.

Spores 7.5–10.0 x 6.0–8.5 µm, mean 8.7 x 6.8 µm, Q: 1.0–1.6, mean asQ: 1.3, very broadly

ovoid or ellipsoid but mostly subglobose, with prominent apiculus, hyaline, thin-walled, non-amyloid, often with dark contents. Basidia 33–42 x 7–11 µm, mean 37 x 9 µm, Q: 3.1–4.7, mean Q: 4.0, (1-,2-,3-) 4-spored, clamped. Cheilocystidia 46–130 x 15–35 µm, inflated, hyaline, thin-walled, globose, pyriform or clavate, clamped, conspicuous and densely crowded along the lamellae margins. Pleurocystidia absent. Hymenophoral trama regular, composed of thin-walled, tubular, parallel, aseptate hyphae 2–22 x 1000–2000 (–3000) µm; the hyphal ends tapering to obtuse or rounded apices, often sinuous, and frequently with dark contents; lactifers (6–14 µm) intermixed. Pileipellis a cutis of cylindrical, thin-walled, clamped hyphae 5–18(–24) µm diameter with lactiferous hyphae 6–14 µm intermixed; fibrillose hyphae present with dark contents 4–12 µm diameter. Caulocystidia absent. Stipitipellis a fibrillose cutis of parallel, thin-walled, clamped hyphae, 3–8 µm often with dark plasmatic contents.

Habitat: Solitary or in small groups on soil amongst forest leaf litter; often in very sheltered and moist locations.

Specimens examined: New South Wales. Bola Creek-Royal NP, 15 June 1998, *F. Taeker*, (*Young* 2119 in DAR); Mt. Wilson, 17 June 1998, *A. M. Young*, (*Young* 2143 in BRI).

Remarks: Photographs from the Gore Creek site have been conclusively identified as this taxon which is reported to appear regularly each season. No material is held. The red then blackening, conical pileus with numerous adpressed black fibrils is unmistakable, and it is only a matter of time before the taxon is re-collected. The species occurs widely in the Sydney and Blue Mountains district. Cleland collections of this species were misidentified as *Hygrophorus conica* Fr. but an unmistakable watercolour of this taxon was made by Miss Clarke from a May 1915 Cleland collection from Neutral Bay. The known Australian range extends from south eastern Queensland to Tasmania.

Subgen. **Pseudohygrocybe** M. Bon., Doc. Mycol. **24**: 42 (1976). **Type:** *Hygrocybe coccinea* (Schaeff.: Fr.) Kummer.

Hymenophoral trama regular, subregular to slightly irregular, composed of short, cylindrical to inflated elements 20–300 µm long (rarely up to 700 µm); basidiome variously coloured often brightly (red, orange, yellow, green, lilac); pileus conical, convex or umbilicate; lamellae narrowly adnate to decurrent; cystidia sometimes present as cheilocystidia, rarely as

pseudo-pleurocystidia; clamps generally present throughout the basidiome.

7. *Hygrocybe anomala* A. M. Young, Aust. Syst. Bot. **10**: 919 (1997). **Type:** New South Wales. Blackheath. 23 June 1983, A. E. Wood, UNSW 83/991 (holo: UNSW).

1. Pileus viscid; without lilac tints on pileus or lamellae var. ***anomala***
 Pileus dry; lilac tints present on either or both pileus and lamellae
 var. ***ianthinomarginata***

Hygrocybe anomala* var. *anomala

H. anomala var. *anomala* has not been recorded from the Lane Cove Bushland Park.

Hygrocybe anomala* var. *ianthinomarginata, A. M. Young var. **nov.** Differt a *H. anomala* pilei marginata lilacina vel ianthona, lamellae lilacinae, epicute pilei et stipes cutem formans nunquam ixocutem. **Typus:** New South Wales. Lane Cove Bushland Park. 33°49'S 151°10'E. 13 June 1998, R. & E. Kearney & A. M. Young. [DAR 73918] (holo: DAR).

Pileus 8–18 mm, convex to expanded convex or sometimes slightly umbonate, orange brown (5B4–4A3) or buff (4A3–4B4) and almost always with a darker, reddish centre 'dot' (7A8) especially as the pileus matures, smooth, dry, finely scaly under a x10 lens, striate, margins strongly crenulate and tinted lavender/lilac/violet (12A2–14A2). Lamellae decurrent, pale lilac (12A2–14A2) sometimes deeper lavender/violet 16A3–16A4) and occasionally with pinkish tints, margins even and concolorous, thick, distant, veins present on the pileus undersurface. Stipe 20–40 x 1.5–2.5 mm, red, reddish orange or orange (5A7, 7A8–8A8), smooth to finely fibrillose, dry, hollow, cylindrical.

Spores (6.0–)6.7–8.7(–10.0) x 4.0–5.7(–6.0) µm, mean 7.7 x 4.5 µm, Q: 1.4–2.2, mean Q: 1.7, smooth, hyaline, ovoid or ellipsoid to cylindrical and at least some cylindrical spores medially constricted. Spinose spores scattered frequently, occasionally or sometimes

infrequently amongst the normal spores and having similar overall dimensions and Q's to those of normal spores, outline frequently polygonal with the spines emerging from the angles of the polygon, spines conical, apices obtuse and 0.5–2.5 µm in height. Basidia 33–57 x 6–8 µm, mean 44 x 7 µm, Q: 5.0–8.0, mean Q: 6.1, 4-spored, clamped. Cystidia absent. Hymenophoral trama regular to subregular, in the upper 2/3rds of the lamella composed of parallel chains of cylindrical, hyaline, thin walled elements 10–45 x 4–11 µm but then becoming irregular and the lower 1/3 of the lamellae near the margins composed of subglobose to polyhedral, hyaline, thin walled elements 4–12 µm diameter, clamps present but sometimes rare. Pileipellis a cutis composed of repent, hyaline, thin walled cylindrical hyphae 2–5 µm diameter, clamps present. Stipitipellis a cutis of repent, thin walled, hyaline, cylindrical septate hyphae 1–4 µm diameter, clamps occasional. Fig. 3.

Habitat: Gregarious or caespitose on soil amongst litter, occasionally may occur in small troops.

Remarks: *Hygrocybe anomala* was described from a collection which represented one of the basidiome variations produced by this mutable taxon. Further collections indicate that the viscid characters of stipe and pileus may or may not be present. The Lane Cove Bushland Park collections do not appear to have any viscosity of either pileus or stipe, however the viscid nature of both structures is clearly recorded in photographs for both the holotype of var. *anomala* and the accompanying

collection of UNSW 83/988A. In addition, re-examination of the holotype (UNSW 83/991) of var. *anomala*, with emphasis on the juvenile basidiomes, has clearly demonstrated the agglutinated/gelatinised nature of the surface hyphae of the pileus together with numbers of spores that adhere very firmly to the surface hyphae even after gentle warmth is applied to mounted preparations of the pileipellis. There is now no doubt that var. *anomala* has an ixocutis even though it may apparently be absent in mature basidiomes due to local climatic conditions. The new variety does not appear ever to produce an ixocutis on either pileus or stipe.

Pinkish tints only were recorded for the lamellae of var. *anomala* and neither of the Blackheath collections show a lilac/violet margin to the pileus. Collections of var. *ianthinomarginata* made from various locations in the Sydney and Blue Mountains region during the 1998 collecting season show that the lilac tints of the lamellae are generally very distinctive when the basidiomes are

young but then may fade a little as the basidiome matures.

The colours of the pileus and stipe in both varieties are inconstant. Depending upon the collection, the pileus varies from warm orange to pallid yellow orange while the central, reddish brown 'dot' may or may not be prominent. The stipe colour is also variable and may range from pallid orange yellow to strongly orange red or almost pure red.

Re-examination of the var. *anomala* holotype collection demonstrated conclusively that the material has a sub-regular tramal structure with interwoven hyphae at higher magnification (x400), however at lower magnification (x100) the trama appears more or less regular. The trama's structure also varies depending upon where it is examined: near the lamellae margins, it is usually more irregular, at the midpoint between margin and pileus it is usually sub-regular, while near the pileus, it is generally regular. There seems little doubt that *H. anomala* was incorrectly placed in subgenus

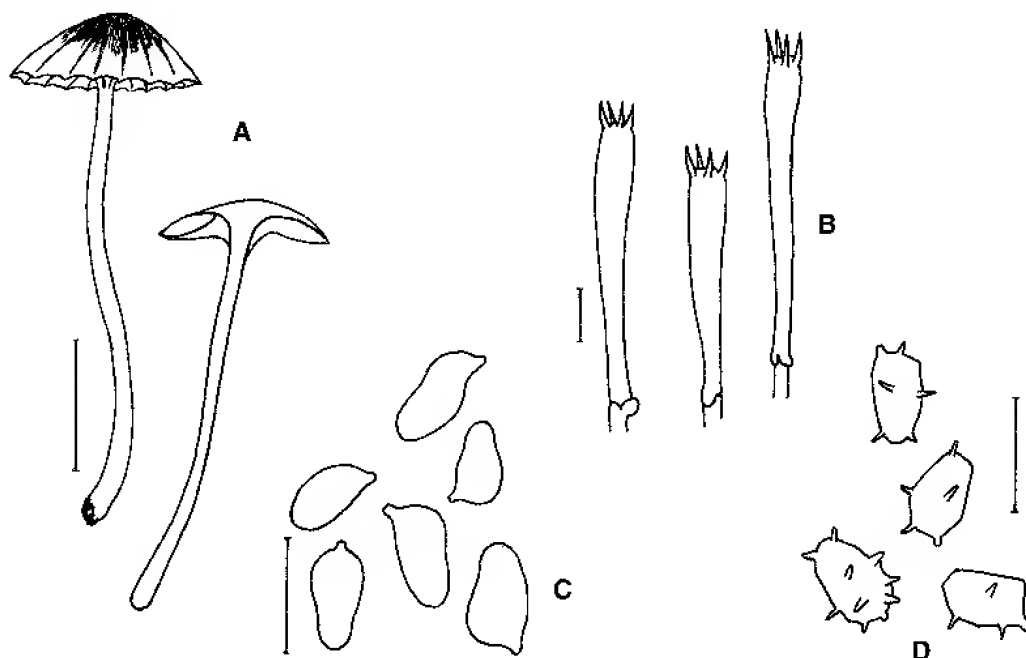


Fig. 3. *Hygrocybe anomala* var. *ianthinomarginata*. A. Habit (bar = 10 mm); B. basidia; C. normal spores; D. spinose spores (bar = 10 µm). Holotype DAR 73918.

Cuphophyllus in the previous paper of Young and Wood (1997) and should be transferred to sub-genus *Pseudohygrocybe*.

Hygrocybe anomala is very wide spread with collections of both varieties also known from Tasmania. It seems to be unique amongst the Australian species with its spinose spores scattered amongst the normal spores. Examination of a number of collections has shown that in any one collection, the number of spinose spores present may vary from very common to sparse. Re-examination of the holotype of var. *anomala* and the accompanying Blackheath material (UNSW 83/988A) has revealed abundant 'polygonal', spinose spores in both collections. It is difficult to account for their omission from the original description, however no spinose spores were known to occur in any Australian species of this genus at that time. Even if the spinose spores had been sighted, they would have been disregarded as contaminants. The spores are sometimes difficult to find and can be overlooked, however they have been found to be present in all collections believed to be this taxon, including the material obtained from further field work in the Blue Mountains of New South Wales during 1998. Usually, the 'polygonal' outline of the spores (typically with the spines emerging from the corners) is quite distinctive under the microscope but these spinose spores also appear to have a slightly different refractive index to the normal spores and they frequently take up the mounting stain more intensely than the normal spores. Experience has shown that they are best searched for in areas of a lamella squash that have not been thoroughly spread apart because they seem to adhere more strongly to the hymenial layer. They are shed from the basidia like normal spores as they can be found on the stipe surface and very occasionally on the pileus surface, obviously been distributed by wind currents.

Etymology: Greek, *ianthinus*, violet or lilac, referring to the lilac margins of the pileus.

8. *Hygrocybe aurantipes* A. M. Young, Aust. Syst. Bot. **10**, 954 (1997). **Type:** New South Wales. Lane Cove Bushland Park, 33°49'S

151°10'E, 17 June 1990, R. Kearney & B. Rees [UNSW 90/208](holo: UNSW).

Illustration: Young & Wood (1997), p955.

Pileus 20–40 mm, conical becoming expanded conical and finally more or less plane sometimes with the margins reflexed, smooth, dry; not radially fibrillose; at first dark olivaceous brown (4F8–5F8) then rapidly with greenish yellow tints as the pileus expands and often with orange tints when old; margins not splitting, a little pellucid striate and usually lighter in colour when young. Lamellae narrowly adnate to adnate with slight decurrent tooth, distant, thick, extensively connected by veins across the pileus' undersurface and these may reach up to halfway across the lamellae face, 1 set lamellulae, yellowish cream to buff-cream or yellowish orange (3A4–3B4), margins concolorous. Stipe 30–60 x 3.5–7.0 mm, cylindrical but often flattened, the stipe base may be either inflated or slightly tapered, smooth, dry, pale yellow-orange (4A6, 5A6–6A6) but sometimes with apricot pink tints, usually more pallid superiorly, base concolorous but may be white or more yellowish, hollow.

Spores (7.0–)7.3–10.0 x (4.3–)4.5–6.0 μm, mean 8.3 x 5.1 μm, Q: 1.4–1.9, mean Q: 1.6, broadly oblong to ellipsoid, occasionally a little constricted, smooth, hyaline, non-amyloid. Basidia (46–)51–71 x 7–10 μm, mean 56 x 8.5 μm, Q: 5.0–9.0, mean Q: 7.0, (2-)4-spored, clamped. Cystidia absent. Hymenophoral trama regular, composed of short, inflated, often tapering elements 25–120(–150) x 4–30 μm, interspersed with occasional branching hyphae 4–10 μm diameter, clamps present and sometimes approaching medallion clamps, lactifers present as highly refractive, tortuous, hyaline, thin-walled hyphae 3–7 μm. Pileipellis a cutis composed of hyaline, thin-walled, clamped hyphae 1–3 μm diameter overlying a subpellis of inflated, clamped, fusiform to cylindrical elements 30–150 x 4–20(–30) μm, lactifers present in the subpellicular layer as highly refractive, thin-walled, hyphae 3–7 μm and with slightly brownish contents. Stipitipellis a cutis of clamped, hyaline, thin-walled hyphae 1–3 μm diameter, overlying cylindrical, septate, rarely clamped hyphae up to 8 μm diameter.

Habitat and distribution: Gregarious on soil in woodland or rainforest; abundant in the Blue Mountains, New South Wales.

Specimens examined: New South Wales. Mt. Wilson, 17 June 1998, A. M. Young (Young 2145 in DAR); Lane Cove Bushland Park, 33°49'S 151°10'E 12 August 1998, R. & E. Kearney (Young 2157 in BRI).

Remarks: The species is quite distinctive with its olive brown pilei and very contrasting bright yellow-orange stipe and lamellae.

9. *Hygrocybe cantharellus* (Schwein.) Murrill, (as *Hydrocybe*), *Mycologia* **3**: 196 (1911); *Agaricus cantharellus* Schwein., *Schr. Nat. Ges. Leipzig* **1**: 88 (1822); *Hygrophorus cantharellus* (Schwein.) Fr., *Epicr.*: 329 (1838). **Type:** none designated.

Illustrations: Boertmann, D (1995): 111; Young & Wood (1997), p962.

Pileus (9–)10–22 mm, hemispherical to convex or plano-convex, occasionally slightly depressed at the centre, margins almost always distinctly crenulate, surface dry and smooth except for the centre where the pileus is usually slightly to distinctly scurfy or finely fibrillose, dull to brilliant red (7B5/7C6) fading to lighter shades of red or orange (5B5) with age and often more or less yellowish at the margins, may appear very slightly striate when moist. Lamellae usually very distant, thick, off-white or pale cream coloured (2A2) becoming yellow (3A5), margins concolorous and even, very broadly adnate with decurrent tooth or arcuate or more commonly deeply decurrent. Stipe 20–45 x 1–2.5 mm, cylindrical or occasionally slightly flattened, smooth, dry, brilliant red (10A8) often yellowish at the extreme base.

Spores (7.0–) 8.0–11.0(–11.5) x (4.0–)5.0–7.0(–9.0) µm, mean 9.3 x 6.3 µm, Q (1.2–)1.4–2.1, mean Q: 1.4, ellipsoid, oblong or occasionally phaseoliform, smooth, hyaline, non-amyloid. Basidia 36–61 x 7–11 µm, mean 45 x 9 µm, Q: 3.3–8.5, mean Q: 5.2, mostly 4-spored but occasionally 2-spored, clamped and narrowly clavate in some collections but broadly clavate in others. Cystidia absent. Hymenophoral trama regular, composed of clamped, parallel to slightly interwoven hyphae which are often inflated and constricted at the septa, 24–90 x

3–20 µm. Pileipellis a cutis of clamped hyphae (4–)6–12 µm, constricted at most septa with a trichoderm at the centre. Stipitipellis a cutis of thin-walled, hyaline, clamped hyphae 1–3 µm overlying similar but broader hyphae 5–12 µm.

Habitat and distribution: Gregarious and common on soil amongst moss and litter in forests, especially beside creek banks in eastern Australia.

Specimen examined: New South Wales. Lane Cove Bushland Park, 33°49'S 151°10'E. 12 September 1998, R. & E. Kearney (Young 2194 in BRI).

Remarks: The distinguishing characteristics of this taxon are the dry, red pileus and stipe, the finely velvety surface of the pileus (at least at its centre) and the yellowish, decurrent lamellae. A basidiome always has an 'elongated, tent-peg' shape with narrow diameter pileus and long stipe.

10. *Hygrocybe chromolimonea* (G. Stevenson) May & Wood, *Mycotaxon* **54**: 147–150 (1995); *Hygrophorus chromolimoneus* G. Stevenson, *Kew Bull.* **16**: 383 (1962), *Gliophorus chromolimoneus* (G. Stevenson) Horak, *Beih. Nova Hedwigia* **43**: 167 (1973). **Type:** New Zealand. Lake Rotoiti, 16 May 1956, E. B. Kidson, [Stevenson 1088 in K](holo: K).

Illustrations: Fuhrer and Robinson (1992): 41; Young & Wood (1997), p964.

Pileus 7–20 mm, convex with centre depressed and becoming plane but remaining somewhat umbilicate, smooth, viscid to glutinous, bright chrome yellow (all shades from 1A8–3A8) fading with age, a little translucent striate; margins crenulate. Lamellae arcuate or decurrent, thin, spaced, 1 set of lamellulae, light chrome yellow becoming pale lemon yellow (1A4–2A4), margins usually slightly greyish due to the presence of a glutinous thread. Stipe 30–35 x 2–3 mm, equal or tapering downwards, smooth, viscid to glutinous, chrome yellow (similar to pileus) becoming paler with age.

Spores (6.3–)7.0–9.0(–11.0) x 4.0–6.0(–6.7) µm, mean 7.7 x 4.8 µm, Q: (1.2–)1.4–1.8, mean Q: 1.6, oblong to elliptical, smooth, hyaline, thin-walled, non-amyloid. Basidia (31–)36–46

(–50) x (6–)6.5–9(–10.5) µm, mean 39 x 7.5 µm, Q: 4.0–6.5, mean Q: 5.5, 4-spored, clamped. Cheilocystidia gelatinised, embedded in a thread of clear gluten, abundant and occasionally interspersed with basidia, hyaline, thin-walled, clavate and often sinuous, clamped at their bases, 30–50 x 3–8 µm. Pleurocystidia absent. Hymenophoral trama regular and composed of parallel and inflated elements, hyaline, thin-walled, varying from more or less cylindrical to sub-globular, frequently clamped, 30–90 x 12–55 µm. Pileipellis an ixotrichoderm of septate hyphae, 3–6 µm diameter, clamped, hyphae usually aerial but may be firmly adpressed to the pileus on maturity, strongly gelatinised and difficult to discern; the ixotrichoderm overlying a subpellicle of hyaline, thin-walled, clamped, inflated more or less cylindrical cells, 50–200 x 16–25 µm. Stipitipellis an ixocutis of clamped, hyaline, cylindrical hyphae 2–3 µm, subpellicle of parallel, hyaline, clamped, thin-walled hyphae 5–12 µm.

Habitat and distribution: Gregarious on soil in forest, but apparently rare at the Lane Cove site. The species also occurs in Tasmania.

Specimens examined: New South Wales. Lane Cove Bushland Park, 33°49'S 151°10'E. 13 June 1998, A. M. Young (*Young* 2113 in DAR); 12 July 1998, R. & E. Kearney (*Young* 2160 in BRI).

Remarks: The viscid and wholly bright yellow basidiomes are very distinctive. The greyish, glutinous edge on each lamella is easily seen with a x10 hand lens.

11. *Hygrocybe erythrocala* A. M. Young, Aust. Syst. Bot. **10**: 970 (1997). **Type:** New South Wales. Mt. Wilson, 27 March 1993, A. E. Wood [UNSW 93/7] (holo: UNSW).

Illustration: Young & Wood (1997), p971.

Pileus 14–35 mm, conical becoming broadly obtuse conical or sub-umbonate, at first viscid but usually very quickly drying and then appearing shiny as if varnished (see notes below), smooth, light crimson (10A8) to orange (near 6A8) but paling with age and margins more yellow-orange (5A7), pellucid striate from the margins up to one third of the pileus diameter. Lamellae broadly adnate with a very small decurrent tooth, thick, spaced, cream then

pinkish cream or with orange tints (4A5–4A4), margins concolorous and even. Stipe 20–30 x 2–3.5 mm, equal, firm, smooth, dry or a little sticky, yellowish or yellowish orange (4A5–4A4) inferiorly and flushed pink (6A4) near the lamellae.

Spores (6.3–)6.7–9.0(–9.5) x (3.3–)3.7–4.7(–5.0) µm, mean 7.3 x 4.1 µm, Q: 1.4–2.0 (–2.5), mean Q: 1.8, oblong to ellipsoid or sub-lacrymoid, sometimes medially constricted, hyaline, thin-walled, non-amyloid. Basidia (35–)38–46(–50) x 5–8(–10) µm, mean 42 x 6 µm, Q: (4.1–)5.9–8.2, mean Q: 6.9, 4-spored, rarely 2-spored, clamped. Cystidia absent. Hymenophoral trama regular, composed of thin-walled, hyaline elements, some of which are inflated and sub-fusoid while others are more or less cylindrical 22–90(–100) x 6–18 µm, clamps present and may be medallion form especially with the inflated sub-fusiform elements, lactifers present as highly refractive, thin-walled, hyaline, tortuous hyphae 2–5 µm. Pileipellis an ixocutis of repent, clamped, hyaline hyphae 3–12 µm but with erect elements up to 60 µm high sometimes with inflated terminal elements, lactifers present as hyaline, thin-walled, highly refractive hyphae 4–6 µm, overlying a subpellicular trama of more or less elliptical to sub-fusoid, hyaline, thin-walled, clamped cells 20–60 x 10–40 µm. Stipitipellis a cutis to ixocutis of repent, hyaline, clamped, thin-walled hyphae 2–6 µm.

Habitat and distribution: Gregarious on soil in rainforest. The species is widespread in the Sydney and Blue Mountains district of New South Wales.

Specimens examined: New South Wales. Lane Cove Bushland Park, 33°49'S 151°10'E. 7 June 1998, R. & E. Kearney (*Young* 2072 in BRI); 13 June 1998, A. M. Young (*Young* 2108 in DAR).

Remarks: The viscosity of *H. erythrocala* is very variable. Young basidiomes are distinctly viscid on the pileus and to a much lesser degree (or even dry) on the stipe in humid conditions, but this character is quickly lost during dry weather or even as the basidiomes mature. When dry, the pilei become opaque and the striations disappear. The colour of the pileus also varies: some collections are bright red but others are orange.

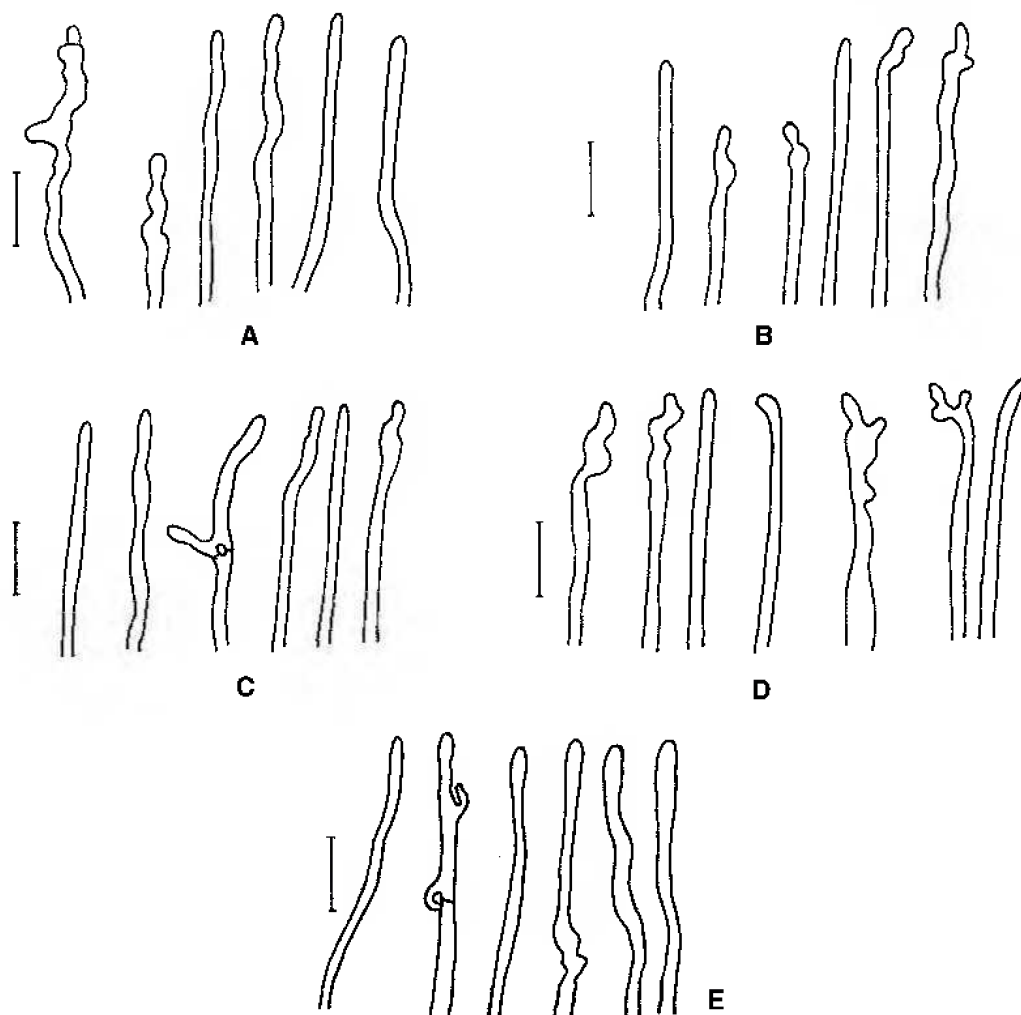


Fig. 4. *Hygrocybe graminicolor*. Typical cheilocystidial endings from: A. *Gliophorus graminicolor* holotype PDD 27096 B. *Gliophorus pallida* holotype PDD 27090; C. Typical Australian *Hygrocybe graminicolor* Y2150, Y2170; D. Typical Australian *Hygrocybe pallida* Y2070, Y2186; E. *Hygrocybe batesii* holotype UNSW 84/522 (bars = 10 μ m).

12. *Hygrocybe graminicolor* (Horak) May & Wood, Mycotaxon **54**: 147–150 (1995); *Gliophorus graminicolor* Horak, Beih. Nova Hedwigia **43**: 176 (1973). **Type:** New Zealand. Ngahere, 21 March 1968, E. Horak, [PDD 27096](holo: PDD).

Hygrocybe batesii A. M. Young, Aust. Syst. Bot. **10**: 956 (1997). **Type:** Australia. New South Wales. Monga State Forest, 16 May 1984, A. E. Wood & N. B. Gartrell [UNSW 84/522](holo: UNSW).

Gliophorus pallidus Horak, Beih. Nova Hedwigia **43**: 164 (1973). **Type:** New Zealand. Auckland, 27 June 1968, E. Horak [PDD 27090](holo: PDD).

Misapplied: *Hygrocybe pallida* (Horak) A. M. Young, in Young & Wood, Aust. Syst. Bot. **10**: 992 (1997) (nom. illeg. Art. 53.1); non-*Hygrocybe pallida* (A. H. Smith) Singer, Beih. zur Sydowia **7**: 7(1973). *Hygrocybe viridis* sensu Young (1986).

Illustrations: Fuhrer and Robinson (1992): 40; Young & Wood (1997), p975 and p958 as *H. batesii*.

Pileus 11–30 mm, convex becoming umbilicate or plane and depressed at the centre, may become irregularly repand or slightly infundibuliform, smooth, pellucid striate, viscid to glutinous; polychromatic: at first deep, dull green (30E8–28E8) fading with pileus expansion to brown (4B5) but usually darker at the centre (5C8), finally light brown (5C6); or brown (4B5) from the start and becoming lighter (5C6) with maturity and sometimes with orange tints; or deep grass-green (21F8–9) but darker at the centre and retaining this colour throughout the life of the basidiome or fading with age; rain wash may denude old specimens of the green pigments and the pileus then presents a pallid pink appearance. Lamellae broadly adnate with a decurrent tooth to distinctly arcuate or sub-decurrent or deeply decurrent, thick, distant, white to tinted green (30B4), often the lamellae colour is lost with maturity and they are then white with the faintest of green tints, margins slightly grey-green and with a fine glutinous thread along the edge. Stipe 16–40(–60) x 1.5–4.0 mm, polychromatic with the same colourations as the pileus although the green tints seem to remain longer on the stipe and may often be found at the base which remains yellowish green, or sometimes with slight yellowish tints at the base which is always paler, viscid to glutinous, cylindrical, hollow, smooth.

Spores (5.0–)5.3–8.0(–8.5) x 3.5–5.0 μm, mean 6.5 x 4.1 μm, Q: 1.3–2.0, mean Q: 1.6, ellipsoid, oblong or amygdaliform, rarely very slightly constricted, hyaline, smooth, non-amyloid. Basidia (25–)30–41(–53) x 5–7 μm, mean 38 x 5.5 μm, Q: (4.4–)5.3–8.0(–9.0), mean Q: 6.5, (2-)4-spored, clavate, clamped at the base and with medallion clamps occasional to frequent. Cheilocystidia densely crowded on lamellae margins and composed of thin-walled, hyaline hyphae, 1.0–5.0 μm diameter and up to 90 μm high, septate, clamped, branching and rounded at the tips, simple to carunculated or finely branched at the tips or contorted and often sinuous, embedded in a gluten layer along the lamella margin. Pleurocystidia none.

Hymenophoral trama regular, composed of hyaline, inflated, thin-walled, clamped cells 26–70 x 4–25 μm. Pileipellis an ixotrichoderm of fine, thin-walled, hyaline, clamped hyphae 2.0–4.0 μm diameter, branching, rounded at the tips and embedded in a layer of gluten up to 130 μm thick, subpellicle of shorter, clamped cells 20–60 x 4–12 μm. Stipitipellis an ixotrichoderm similar in structure to the pileus with hyphal caulocystidia identical in size and shape to cheilocystidia. Fig. 4.

Habitat and distribution: Solitary to gregarious in 2's or 3's or caespitose or in troops on soil amongst litter in rainforest or eucalypt forest; also amongst moss in cool temperate forests of Tasmania.

Specimen examined: New South Wales. Lane Cove Bushland Park, 33°49'S 151°10'E, 20 June 1998, R. & E. Kearney (Young 2170 in BRI).

Remarks: In the Sydney region, *H. graminicolor* occurs frequently in the litter accumulation areas below overhanging rock shelves where the water run-off from rain is concentrated. Dried material loses its green colour and becomes brick-pink.

H. graminicolor is now known to be polychromatic and the taxon previously accepted as *H. batesii* is now confirmed as one of the extreme colour variants of this very variable taxon. The problems resolved here amply illustrate the difficulties of describing new taxa from herbarium material, even when good collections exist and excellent field descriptions are held. The polychromatic nature of *Hygrocybe graminicolor* was brought to the author's attention by Mr. Alan Mills of the University of Tasmania and has now been confirmed from extensive collections in both Tasmania and New South Wales. Basidiomes with all possible colours or colour mixtures from grass green to orange brown can be seen in these troops which numerous observations strongly suggest are derived from a single mycelium in each case.

The species *Gliophorus pallidus* Horak was illegitimately transferred to the genus *Hygrocybe* by Young in Young and Wood (1997) as *Hygrocybe pallida*. Two Australian

collections, UNSW 86/234 and UNSW 92/207 were cited as belonging to this New Zealand taxon. Re-examination of the field descriptions and the macro- and micro-data held for these collections has conclusively determined that both are representative of the very pale brown form of *Hygrocybe graminicolor*. The field notes for each collection clearly state that there is a green tint at the base of the stipe and this, with the remainder of the data allows of no doubt as to the above re-determination. Examination of the holotype of *Gliophorus pallidus* has shown that its spore and basidial measurements, the macro- and micro-structures and particularly the cheilocystidial structure are typical of the species *Hygrocybe graminicolor*. (See Figure 4.). The watercolour by Marie Taylor (1970) stated by Horak (1990) to be identical to *Gliophorus pallidus* is also typical of the light brown end of the colour range for *Hygrocybe graminicolor*. There is little doubt that *Gliophorus pallidus* was erected on a similar basis as for *Hygrocybe batesii* and that *Gliophorus pallidus* represents the brown end of the colour range of *Hygrocybe graminicolor* in New Zealand.

13. *Hygrocybe kula* Grgurinovic, Larger Fungi of South Australia: 336 (1997). **Type:** New South Wales. Royal National Park, 15 July 1916, *J. B. Cleland* [AD 5716] (holo: AD).

Illustration: Young & Wood (1997), p980.

Pileus 7–30 mm, convex then becoming rather flattened and occasionally centrally depressed; dry; smooth or often mealy; brilliant crimson, (near 8A8 10A8); margins crenulate (especially when young) to even, not cracking, may be yellow tinted. Lamellae broadly adnate with a slight decurrent tooth; veins often present on the upper lamellae surfaces and on the pileus undersurface, thick, widely spaced, pure white becoming cream coloured (3A2 4A2) with age, margins concolorous. Stipe 11–35 x 2–3 mm; more or less cylindrical although occasionally with a tendency to become flattened and frequently is sinuous; firm; smooth; dry; at first brilliant crimson, but paling with age and may become pinkish cream; the base has a tendency to become yellow tinted and this may spread upwards. Odour none, taste mild.

Spores 6.5–10.0 x (3.5–)4.0–7.0 µm, mean 8.4 x 5.4 µm, Q: 1.3–1.9, mean Q: 1.6, oblong to ellipsoid and occasionally slightly constricted medially, apiculus prominent 1–2 µm. Basidia 27–40 x 6–9 µm, mean 36 x 6 µm, Q: 4.5–7.6, mean Q: 5.6, narrowly clavate, 2- or 4-spored, clamped. Cystidia absent. Hymenophoral trama regular, composed of cylindrical, clamped, and occasionally inflated elements 25–60(–100) x 2–10 µm; lactifers present as highly refractive, tortuous and sometimes branching, clamped hyphae 2–4 µm. Pileipellis a cutis of clamped hyphae, 3–5 µm diameter; lactifers occasionally present and similar to those in the hymenophoral trama. Stipitipellis a cutis of hyaline, thin-walled, clamped hyphae 3–5 µm.

Habitat and distribution: On soil in rainforest or at least in very sheltered locations; gregarious to caespitose. Recorded from South Australia, New South Wales and Queensland.

Specimen examined: New South Wales. Lane Cove Bushland Park, 33°49'S 151°10'E, 7 June 1998, *R. & E. Kearney*, (Young 2078 in BRI).

Remarks: This species resembles *H. miniata* (Fr.: Fr.) Kummer which differs by having yellow-pink lamellae and a pileipellis that is a trichoderm. A second bright red taxon with white lamellae is *Hygrocybe lanecovensensis* which can be distinguished by its deeply decurrent lamellae and distinctly viscid pileus and stipe both of which remain viscid at least until the basidiome is half expanded.

14. *Hygrocybe lanecovensensis* A. M. Young, **sp. nov.** Pileus 10–23 mm, scarlatinus, convexus, viscidus diende viscidulus vel siccus, glaber, ad marginem crenulatus et flavus. Lamellae decurrentes, albae, diende flavidus, ad marginem concolores. Stipes 25–50 x 2–5 mm, scarlatinus, viscidus diende viscidulus vel siccus, cylindricus, glaber. Sporae (6.0–)6.7–8.0 x 3.7–5.0(–5.3) µm, Q: 1.4–1.9, ovoideae vel ellipsoideae, aliquot subconstrictae. Basidia 32–47 x (7–)8–10.5 µm, Q: 4.0–6.2, (2-)4-sporea, fibulata. Cystidia nulla. Trama hymenophoralis regularis, fibulata. Epicutis pilei ixocutem formans. Gregaria vel caespitosa in humo sylvestri. **Type:** New South Wales. Lane Cove Bushland

Park, 33°49'S 151°10'E, R. & E. Kearney
& A. M. Young [DAR 73917](holo: DAR).

Pileus 10–23 mm, brilliant scarlet (10A8 but brighter in hue), convex, viscid but soon becoming almost dry and only faintly sticky at maturity, smooth, margins crenulate and very

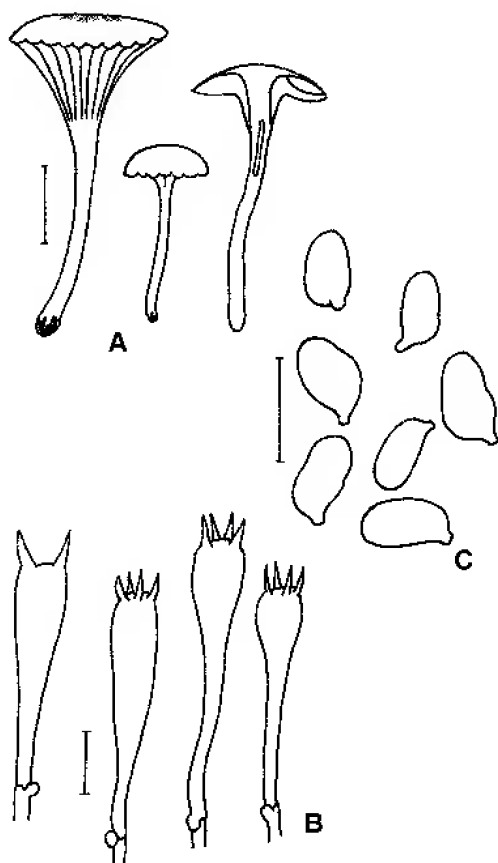


Fig. 5. *Hygrocybe lanecovensis*. A. Habit (bar = 10 mm); B. basidia; C. spores (bar = 10 μ m). Holotype DAR 73917.

finely edged with yellow. Lamellae pure white at first and remaining so until at least half matured, then faintly yellow tinted (4A2) especially when old, deeply decurrent, margins even and concolorous. Stipe 25–50 x 2–5 mm, brilliant scarlet (10A8 but brighter in hue), viscid and tending to remain somewhat viscid until about half matured and then becoming sticky at most, smooth, cylindrical or tapered

downwards, pith filled.

Spores (6.0–)6.7–8.0 x 3.7–5.0(–5.3) μ m, mean 6.9 x 4.2 μ m, Q: 1.4–1.9, mean Q: 1.7, ovoid, long ellipsoid or sub-cylindrical and then often a little constricted, smooth, hyaline, non-amylid. Basidia 32–47 x (7–)8–10.5 μ m, mean 40 x 8.6 μ m, Q: 4.0–6.2, mean Q: 4.6, 2- or 4-spored basidia present in more or less equal numbers and apparently without differences in either basidial sizes or spore sizes, clamped. Cystidia absent. Hymenophoral trama regular and composed of chains of hyaline, thin walled, cylindrical or inflated ellipsoid to subglobose elements 17–58 x 3–20 μ m, clamps present. The tramal elements become increasingly subglobose to globose towards the lamellae margins. Pileipellis a loose ixocutis of repent to slightly interwoven hyaline, thin walled, cylindrical, septate hyphae 1.5–7.5 μ m diameter, clamps present. Stipitipellis an ixocutis of repent, septate, hyaline, thin walled, cylindrical hyphae 1.5–7.5 μ m diameter, clamps present. Fig. 5.

Habitat: Gregarious, caespitose or in troops on sandy soil amongst leaf litter in wet sclerophyll forest or rainforest.

Specimen examined: New South Wales. Lane Cove Bushland Park, 33°49'S 151°10'E, 23 August 1998, R. & E. Kearney (Young 2191 in BRI).

Remarks: The only other taxon that approaches this species is *Hygrocybe kula* which has a dry pileus and stipe and adnate rather than the deeply decurrent lamellae present in this taxon. Its spectacular colouration with pure white and decurrent lamellae coupled with the brilliant red pileus and stipe make it extremely distinctive. The ixocutis is quite distinct when the species is first emerging and the stipe is so viscid/slippy as to make the basidiomes difficult to gather. The viscosity vanishes quite quickly from the pileus but is retained for a longer period on the stipe. Some collections seem to have the yellowish tint appear earlier in the development of the basidiome but the colour is always quite pale. It is very widespread and plentiful at the holotype locality.

Etymology: from Lane Cove Bushland Park, the holotype locality.

15. *Hygrocybe stevensoniae* May & Wood, Mycotaxon **54**: 147–150 (1995); *Hygrophorus viridis* G. Stevenson, Kew Bull. **16(3)**: 383 (1963); *Gliophorus viridis* (G. Stevenson) Horak, Beih. Nova Hedwigia **43**: 173 (1973); non *Hygrocybe viridis* Capelari & Maziero, Mycotaxon **33**: 192 (1988). **Type**: New Zealand. Levin, 26 June 1948, G. Stevenson [Stevenson 338 in K](holo: K).

Misapplied: *Hygrophorus psittacinus* sensu Cleland and Cheel (1919) and Willis (1963); *Hygrocybe psittacina* sensu Shepherd and Totterdell (1988).

Illustrations: Fuhrer and Robinson (1992), p. 41; Young & Wood (1997), p998.

Pileus 10–30(–35) mm, convex to conico-convex expanding to more or less plane in older basidiomes, occasionally with the pileus centre a little depressed, smooth, viscid to glutinous, apple-green to dark green (27C8–27D8) and always darker at the centre, usually yellowish at the margins, pellucid striate in light and dark green for at least half of the pileal radius and often completely, margins even or slightly crenulate. Lamellae adnate with decurrent tooth or arcuate, distant, thick, white with greenish tints to more or less pallid green, margins concolorous, even and without glutinous thread. Stipe 30–40 x 1–3.5 mm, cylindrical to flattened, smooth, viscid to glutinous, green, sometime yellowish at the base.

Spores 6.0–8.0(–10.5) x (3.3–)4.0–5.3(–6.0) μm , mean 7.1 x 4.4 μm , Q: 1.4–1.9(–2.1), mean: Q 1.6, oblong to ellipsoid, smooth, non-amyloid. Basidia 30–45 x (5–)6–9 μm , mean 38 x 7 μm , Q: (3.5–)5.1–7.3, mean Q: 6.0, 4-spored, clamped at the base. Cystidia absent. Hymenophoral trama regular, composed of inflated, hyaline, thin-walled, cylindrical to ellipsoid or subglobose elements, 14–57 x 4.5–15.5 μm , clamps present. Pileipellis an ixotrichoderm with septate, clamped hyphae 2–5 μm in diameter embedded in a layer of gluten 100–150 μm thick, apices usually clavate. Stipitipellis an ixotrichoderm similar to the pileipellis but without the inflated subpellicular layer.

Habitat and distribution: Gregarious on soil

in rainforest or sclerophyll forest amongst litter and usually on soil. Recorded from New South Wales, Tasmania and New Zealand.

Specimens examined: New South Wales. Lane Cove Bushland Park, 33°49'S 151°10'E. 7 June 1998, R. & E. Kearney (Young 2076 in DAR); 13 June 1998, A. M. Young (Young 2112 in BRI).

Remarks: Of the two viscid, green taxa found in the Lane Cove Bushland Park, *H. stevensoniae* appears to be the least common taxon and is readily distinguished from *H. graminicolor* because *H. stevensoniae* lacks cheilocystidia embedded in a marginal gluten thread.

Subgen. **Humidicutis** Singer, Sydowia 2: 28 (1948). **Type:** *Hygrophorus marginatus* Peck.

Hymenophoral trama regular, composed of short, cylindrical to inflated (often moniliform) elements 20–300 μm long; basidiome variously coloured white, pink, dull orange, yellow, or lilac; pileus usually conical becoming umbonate or plane and frequently splitting radially; lamellae narrowly adnate, adnexed or more or less free; cystidia absent; clamps absent throughout the basidiome except at the bases of the basidia and then frequently of medallion form.

16. *Hygrocybe lewellinae* (Kalchbrenner) A. M. Young, Aust. Syst. Bot. **10**: 1011 (1997); *Hygrophorus lewellinae* Kalchbrenner, Proc. Linn. Soc. N.S.W. **7**: 105 (1882). **Type:** Victoria. Western Port, 14 June 1880, M. M. R. Lewellin, [MEL, RB Mss A11](holo: MEL)

Illustrations: Cole, Fuhrer and Holland (1978), plate 3; Young & Wood (1997), p1012.

Pileus 30–65 mm, conical becoming umbonate to almost plane, dry, smooth but innately radially fibrillose, wholly lilac (15B4–16A3) except for the umbo which is usually rather more greyish or greyish brown, whole surface fading with age, often splitting radially at the margins. Flesh very thin, pallid lilac but very dark lilac just under the pileal cuticle. Lamellae narrowly adnate or commonly adnexed to more or less free, if adnate then often breaking free

of the stipe as the pileus expands, pallid lilac, moderately thick, widely spaced and margins concolorous. Stipe 50–70 x 4–8 mm, smooth, dry, hollow, equal but occasionally tapering, pale lilac but sometimes slightly yellowish (4A4) at the extreme base, stipe flesh lilac.

Spores 7.0–11.5 x 4.5–6.0 μm , mean 8.0 x 5.0 μm , Q: 1.3–2.3, mean Q: 1.6; shape variable, subglobose to ovoid or amygdaliform, occasionally almost rectangular, smooth, hyaline, thin-walled, non-amyloid. Basidia 32–41 x 8–10 μm , mean 35 x 9 μm , Q: 2.9–5.1, mean Q: 4.1, 2- or 4-spored, medallion clamps frequent. Cystidia absent. Hymenophoral trama regular, composed of short, parallel, hyaline, thin-walled, septate hyphae and a mixture of cylindrical to inflated hyphae, 26–80 x 5–20 μm , clamps absent or very rare; lactifers present as highly refractive, thin-walled, hyaline, straight to highly contorted and branching hyphae 3–8 μm . Pileipellis a cutis, 40–50 μm thick, composed of thin-walled, septate, hyaline, repent hyphae 4–6 μm diameter with occasional free ends above the surface, clamps absent or very rare, overlaying a subpellicle of inflated, hyaline, thin-walled, ovoid to subfusoid (occasionally subglobose) cells 45–100 x 20–40 μm , clamps absent or very rare; lactifers present similar to those in the hymenophoral trama. Stipitipellis a cutis of hyaline, thin-walled, septate hyphae 2–4 μm , clamps absent.

Habitat and distribution: Solitary or gregarious on soil amongst leaf litter or amongst moss in forests; common in Tasmania and also recorded from Victoria and New South Wales.

Specimen examined: New South Wales. Lane Cove Bushland Park, 33°49'S 151°10'E, 13.vi.1998, A. M. Young, (Young 2102 in BRI).

Remarks: The radial splitting of the pileus which also involves medial splitting of the underlying lamella remains an unusual character shared by this group of taxa which includes the pure white *Hygrocybe mavis* (G. Stevenson) Horak and the pink *Hygrocybe rosella* Horak. Almost all radial splits of the pileal surface occur directly above the medial section of a lamella immediately below and as the split occurs (commencing at the pileus margin) the lamella

is 'torn apart' radially along the middle of its hymenophoral trama to give two half lamellae 'membranes' - each 'membrane' composed of a hymenial layer of basidia, the subhymenial layer and half of the hymenophoral trama. These half lamella 'membranes' remain attached to the pileus along their radial lengths and at the original lamella's margin so that an observer looking down through a radial split from above cannot see through the opening, but instead sees a 'V' shaped surface formed by the interior faces of the two 'membranes' of the lamella still attached to the pileus and at the lamella margins.

17. *Hygrocybe* sp. LC1

Pileus 8–20 mm, convex to parabolic becoming broadly convex or occasionally subconical, brilliant scarlet, dry (but may be a very weak ixocutis - see pileipellis description), smooth or very finely and innately fibrillose, margins yellow and striate. Lamellae strongly decurrent, bright yellow, margins even and concolorous, veins present on pileus undersurface and on the upper faces of the lamellae. Stipe 30–50 x 1.5–2.5 mm, brilliant scarlet but yellowish towards the base, cylindrical, dry, smooth or innately finely fibrillose.

Spores (6.0–)7.3–9.7(–12.0) x (3.3–)4.0–4.7 μm , mean 8.4 x 4.1 μm , Q: 1.5–2.2(–3.0), mean Q: 2.0, ellipsoid, ovoid, obovoid, cylindrical or sometimes lacrymoid, hyaline, thin walled, a majority very strongly constricted. Basidia 34–51 x 6–8(–10) μm , mean 40 x 8 μm , Q: 4.2–6.7, mean Q: 5.0, 2- or 4-spored, clamps present. Cystidia absent. Hymenophoral trama regular and composed of chains of ellipsoid or cylindrical elements that are hyaline, thin walled 17–56 x 4–16 μm , clamps present. Pileipellis a cutis or weak ixocutis composed of repent to slightly interwoven hyphal elements that are thin walled, hyaline 2.5–10.0 μm diameter, clamps present. The pileipellis hyphae may exhibit gelatinisation, lactifers are present in the subcuticular layers as translucent, sometimes contorted hyphae 3–11 μm diameter. Stipitipellis a cutis of repent, hyaline, thin walled, septate, cylindrical hyphae 2.5–4.0 μm diameter, clamps infrequent to occasional. Fig. 6.

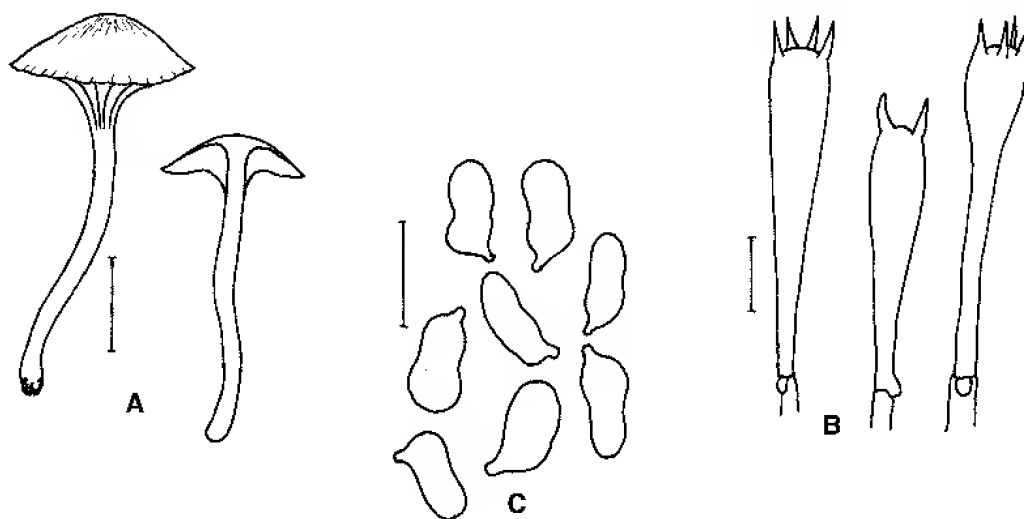


Fig. 6. *Hygrocybe* sp. LC1. A. Habit (bar = 10 mm); B. basidia; C. spores (bar = 10 µm). Y2188.

Habitat: Gregarious to subcaespitose on soil and litter, often in 2's and 3's.

Specimen examined: New South Wales. Lane Cove Bushland Park, 33°49'S 151°10'E, 16 August 1998, R. & E. Kearney, (Young 2188 in BRI).

Remarks: Very small collections of a remarkably beautiful *Hygrocybe* are held for what is believed to be a new species in the genus. Insufficient material is held to permit the full description of a new taxon. The taxon has extremely constricted spores which approach those of *Hygrocybe constrictospora* Arnolds.

Camarophylloopsis Herink, Acta Mus. Horti Bot. Boh. Bor. 1: 61 (1958). **Type:** *C. schulzeri* (Bres.) Herink.

Subgen. **Hodophilus** (R. Heim) Bon, Doc. Mycol. 26: 20 (1996). **Type:** *Hodophilus foetens* (Phill.) R. Heim.

Pileus never trichodermal and always a hymeniderm.

18. Camarophylloopsis kearneyi A. M. Young, **sp. nov.** Pileus 5–11 mm latus, hemisphaericus deinde convexus, glaber, siccus, pallido-brunneus, ad marginem cremeus vel albidus, crenulatus. Lamellae adnatae vel dente decurrente vel arcuatae, albidae, distantes, ad marginem concolorae. Stipes 15–27 x 1.5–2.5 mm,

siccus, pallido-brunneus, fibrillosus, cylindricus. Sporae (4.0–)4.3–5.7 x 4.0 5.3(–5.7) µm, Q: 1.0–1.2(–1.3), subglobosae usque globosae, hyalinae, inamyloideae. Basidia 44–62 x 5.6–8.9 µm, Q: 6.2–8.6, 4-sporea, defibulata. Cheilocystidia 18–44 x 3–7 µm, hyalina, cylindricata, sinuosa, defibulata. Pleurocystidia nulla. Trama hymenophoralis regularis, haud fibulata. Epicutis pilei epithelium formans. Gregaria vel caespitosa in humo sylvestri. **Typus:** New South Wales. Lane Cove Bushland Park. 33°49'S 151°10'E. 13 June 1998, R. & E. Kearney [DAR 73919](holo: DAR).

Pileus 5–11 mm, at first often nearly spheroid then becoming hemispherical or deeply convex; smooth but finely micaceous under a x8 lens; dry; pallid brown (5C4) with darker centre; margins crenulate and paler to near white. Flesh very thin and concolorous with pileus surface. Lamellae adnate or with decurrent tooth or arcuate; distant; white to greyish white; margins concolorous and even. Stipe 15–27 x 1.5–2.5 mm; pale brown (5C2); dry; surface finely fibrillose with brownish, scattered fibrils, cylindrical, solid.

Spores (4.0–)4.3–5.7 x 4.0–5.3(–5.7) µm, mean 4.9 x 4.6 µm; Q: 1.0–1.2(–1.3); mean Q: 1.1; subspherical to spherical; hyaline, smooth.

Basidia 44–62 x 5.6–8.9 μm , mean 49 x 6.6 μm ; Q: 6.2–8.6, mean Q: 7.4; 4-spored occasionally 2-spored; without clamps. Cheilocystidia 18–

44 x 3–7 μm , hyaline, often sinuous, clavate or usually more or less cylindrical and capitate

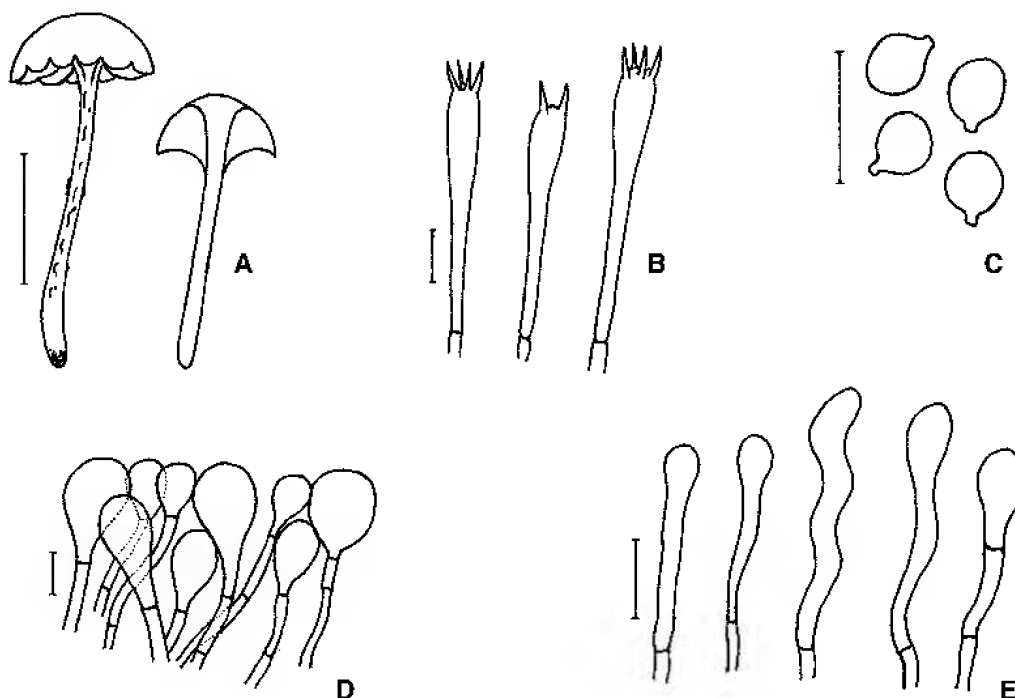


Fig. 7. *Camarophyllopsis kearneyi*. A. Habit (bar = 10 mm); B. basidia; C. spores, D. pileipellis; E. cheilocystidia (bar = 10 μm). Holotype DAR 73919

with a pyriform to subglobose apex; septate at the base; clamps absent. Hymenophoral trama regular composed of hyaline, tubular, septate elements 28–56(–90) x 2–8 μm , clamps absent; lactifers not found. Pileipellis an epithelium composed of a layer of globose to pyriform cells 13–23 μm diameter, clamps absent. Stipitipellis a cutis of hyaline, thin walled, septate, tubular elements 4–8 μm diameter, clamps absent. Caulocystidia scattered or gregarious, similar to the cheilocystidia but usually more contorted 33–67 x 2–8 μm . Fig. 7.

Habitat: Gregarious/caespitose on sandy soil under ferns beside creek in gallery warm-temperate rainforest.

Remarks: This taxon approaches the European species *Camarophyllopsis phaeophylla* (Romag.) Arnolds, but that taxon has no cheilocystidia, an irregular hymenophoral trama

and a stipe without the brownish fibrils present in *C. kearneyi*. The species is quite common under ferns on the bank of Gore Creek but its tiny size and subdued colours render it easily overlooked. There may possibly be a second species of *Camarophyllopsis* at the Gore Creek site. Collections of material readily identified as the genus *Camarophyllopsis* have been found caespitose on sandy soils under coachwood (*Ceratopetalum apetalum*). Dried material and descriptions so far have been inconclusive and the coachwood collections may just be a variety of *C. kearneyi*. Collections of a similar taxon are also known from Mt. Wilson in the Blue Mountains – there appears to be only a minor difference in the attachment of the lamellae which seem to be a little more deeply decurrent. Only a very small amount of the Mt Wilson material is held and these results are therefore inconclusive other than the high probability of an extended distribution for the

Gore Creek species.

Etymology: After Professor Ray Kearney, Associate Professor of the Department of Infectious Diseases, University of Sydney, New South Wales.

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